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Draft

Environmental Impact Statement

Dairy Syncline w/ selection supp comments

rec'd

CARIBOU NATIONAL FOREST [&] ROD

7-25-97

PHOSPHATE LEASING PROPOSAL

*w/12/98
see update*



Northern portion of the Dairy Syncline Tract
(looking east into Slug Creek Corridor)

Beginning to chapter 4.



USDA Forest Service
Caribou National Forest



USDI
Bureau of Land Management
Idaho State Office

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United States
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Forest

550 South 4th Avenue
Federal Bldg Ste 172
Pueblo, CO 81001

File Code: 1556

Date: July 14, 1997

Note to Reader:

The bulk of this document is a draft EIS (DEIS). Included in the back of the document are supplements which amend the DEIS to deal with issues raised midway through the NEPA process, including Selenium and response to public commentary. These documents, together with the DEIS constitute the Final EIS (FEIS). Also included with the document is a copy of the Record of Decision (1999), which implemented the current leases for I-27512 and I-28115.

This EIS was reproduced from a photocopy. Map-type figures have been reduced from 11x17 inches to 8.5x11 inches so that the EIS would be easier to reproduce. Colors on the maps have been lost.

-James Blair

February 14, 2002

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250 South 4th Avenue
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Pocatello, ID 83201

Rec'd
7-25-97

File Code: 1950

Date: July 18, 1997

Dear Reviewer:

We are pleased to announce the completion of the Draft Environmental Impact Statement (DEIS) for the proposed leasing of Federal phosphate reserves within the Caribou National Forest in southeast Idaho (Caribou County). The DEIS addresses the proposed leasing of two tracts referred to as the Dairy Syncline and Manning Creek Tracts.

This DEIS was prepared under contract for the Bureau of Land Management's Pocatello Resource Area and the Caribou National Forest. A copy of the DEIS is enclosed for your review and comment.

The "Preferred Alternative" has been identified as a combination of Alternative #3 (Lease the entire Dairy Syncline Tract) and that part of Alternative #5 dealing with the Manning Creek Tract (Lease only the northern portion of the Manning Creek Tract).

This DEIS was prepared to assess the leasing of the two proposed lease tracts. Leasing is not a land disturbing action, however it can lead to the future development and mining of the leased lands. Conceptual mine plans were developed to assess the impacts that could be associated with lease development. Leasing either or both of these tracts will require the approval of future development plans before site specific mining and reclamation can occur. Approval would only be given after the appropriate site specific National Environmental Policy Act (NEPA) analyses, public participation, and documentation have been completed.

An issue came to light During the final stages of the DEIS preparation that is not discussed in the document. This issue involves increased levels of the element selenium in the water draining from two areas associated with phosphate mining activities. It is possible that the waste rock disposal sites in the areas under investigation may be contributing to the increased selenium levels. Testing and investigations are being conducted to obtain additional information and to determine if other sites within the southeastern Idaho phosphate fields exhibit increased selenium levels.

Due to the limited information currently available and the ongoing nature of the investigations, we anticipate that the Final Environmental Impact Statement (FEIS) may contain some additional information and that the NEPA analyses prepared at the mine plan approval stage (in the event that leasing and subsequent mining occur) will address the selenium issue in greater detail.

Please submit specific issues or other comments that you believe should be considered when preparing the FEIS in writing by September 30, 1997. Comments should be submitted to: Caribou National Forest, Attention Steve Robison, 250 South 4th Avenue, Pocatello, Idaho 83201. Please include your name, address, phone number, and project name.

Caring for the Land and Serving People



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Draft

Environmental Impact Statement

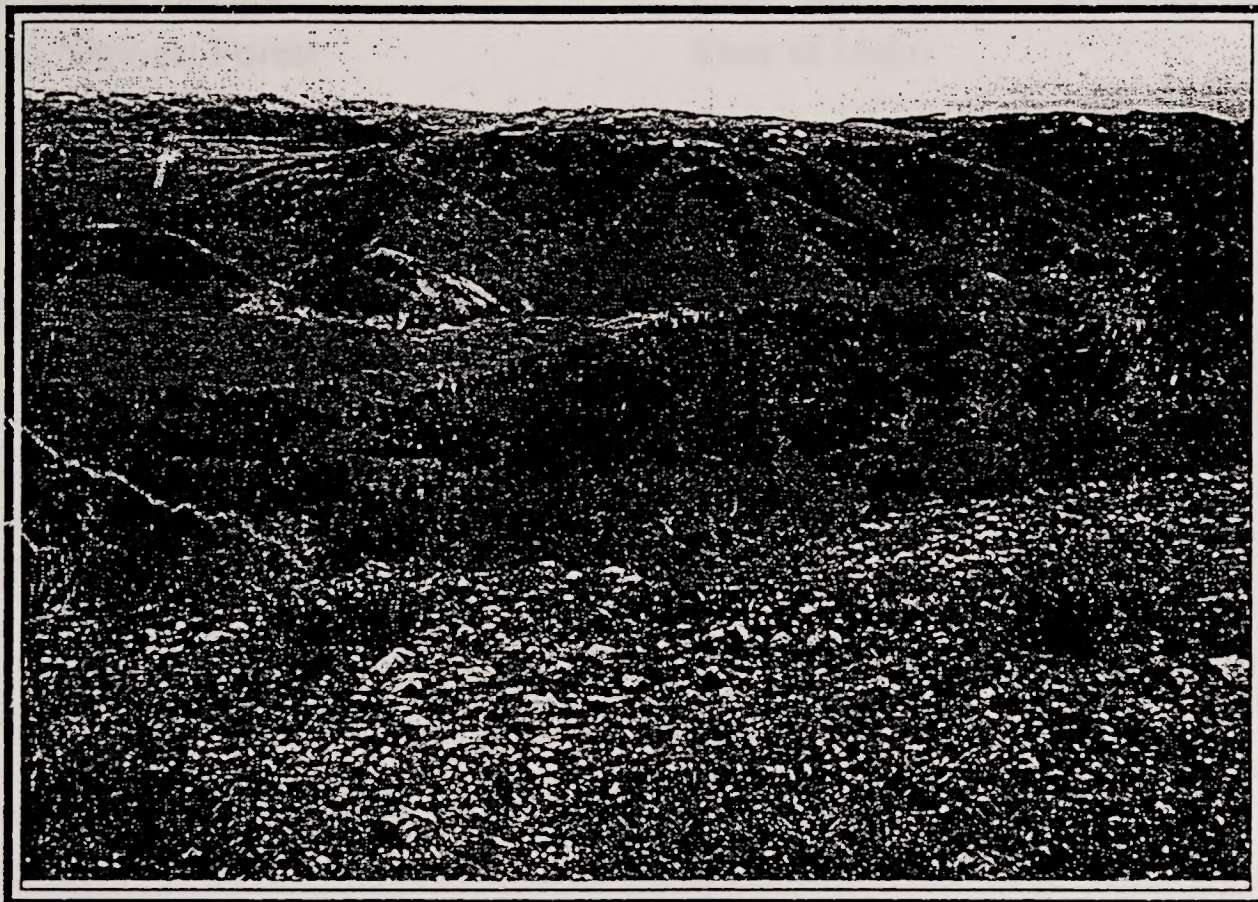
CARIBOU NATIONAL FOREST
PHOSPHATE LEASING PROPOSAL

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See Update



Northern portion of the Dairy Syncline Tract
(looking east into Slug Creek Corridor)



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DRAFT
ENVIRONMENTAL IMPACT STATEMENT

Caribou National Forest Phosphate Leasing Proposal
Caribou County, Idaho

Joint Lead Agencies:

USDA Forest Service
Caribou National Forest

USDI Bureau of Land Management
State of Idaho

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Documentation Preparation

Prepared by
Montane Resource Associates
Under Contract 53-84M8-4-0026

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ABSTRACT

This Environmental Impact Statement documents the analysis of the potential effects of implementing each of five alternatives for phosphate leasing of the proposed Manning Creek and Dairy Syncline tracts administered by the Caribou National Forest in Caribou County, Idaho. The existing condition of the environmental resources in the project area is documented, and potential impacts to those resources as a result of implementing the proposed action are addressed. The alternatives are (1) No Action - No Lease, (2) Lease Both the Manning Creek and Dairy Syncline Tracts (proposed action), (3) Lease the Dairy Syncline Tract and Do Not Lease the Manning Creek Tract, (4) Lease the Manning Creek Tract and Do Not Lease the Dairy Syncline Tract, (5) Lease Portions of the Dairy Syncline and Lease Portions of the Manning Creek Tracts. The document also discloses the information necessary for the Forest Supervisor to make recommendations and the District Manager of the BLM to make a decision in response to the lease applications. The recommendations to be made by the Forest Service are whether or not to lease and, if so, with what stipulations. The decision to be made by the BLM is: which, if any, phosphate reserves within the Dairy Syncline and Manning Creek Tracts should be offered for competitive leasing; and if leased, what stipulations are necessary to help mitigate anticipated impacts or protect the existing surface resources. This decision will be documented in a separate Record of Decision.

Comments on this Draft EIS must be submitted to the Forest Supervisor of the Caribou National Forest no later than 45 days after the DEIS is made available to the public.

NOTE TO REVIEWER

Reviewers should provide the Forest Service with their comments during the review period of the Draft Environmental Impact Statement. This will enable the Forest Service and BLM to analyze and respond to the comments at one time and to use the information acquired in preparation of the Final Environmental Impact Statement thus avoiding undue delay in the decision-making process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to reviewers' position and contentions. **Vermont Yankee Power Corp. v. NRDC**, 435 U.S. 519, 533 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the Final Environmental Impact Statement. **City of Angoon v. Hodel** (9th Circuit, 1986) and **Wisconsin Heritages, Inc. v. Harris**, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the Draft Environmental Impact Statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

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SUMMARY

PURPOSE AND NEED

Two applications have been filed for competitive lease sales for Federal phosphate rights on 5,177 acres within the Carbon National Forest. These were filed with the Bureau of Land Management (BLM) in compliance with the Mineral Leasing Act of 1920 (as amended) and applicable regulations. These proposed lease tracts are called the Dairy Syncline Tract (comprising about 3,230 acres) and the Mowee Creek Tract (comprising about 1,947 acres). The Carbon National Forest (Forest Service) and the Bureau of Land Management (BLM) are required by Federal regulations to respond to these applications. The Forest Service must make recommendations to the BLM and the BLM must make a decision and respond to the lease applications. Recommendations to be made by the Forest Service are whether or not to lease, and if so, with what terms. The decision to be made by the BLM is whether or not, phosphate leases will be sold. Syncline and Mowee Creek Tracts will be offered for competitive bidding and the BLM regulations are necessary in this matter to protect the public interest.

The proposed lease sales are being sold in response to the existing mineral lease. The Carbon National Forest is a phosphate lease area and the BLM must make a decision and respond to the lease applications.

The BLM is required to provide phosphate lease sales to the public and to develop the phosphate lease sales. The BLM is required to provide phosphate lease sales to the public and to develop the phosphate lease sales.

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Some mining companies are running out of phosphate in their existing mines. J.R. Simplot Company and Nu-West Industries requested that these two proposed lease tracts be offered for competitive bid.

The issuance of a competitive phosphate lease conveys the right to mine and develop the phosphate reserves within the lease. Exercise of this right requires the development, review, and approval of site-specific mine development plans that must be submitted by the lease developer to the BLM.

The Caribou National Forest (Forest Service) and the Idaho Falls District, Bureau of Land Management (BLM), have jointly decided that an Environmental Impact Statement (EIS) is necessary to assess and document the anticipated site-specific (as much as possible at the leasing stage) environmental impacts including cumulative effects if the two proposed Federal phosphate tracts are leased for mining within the Caribou National Forest. Part of the mine development plan review process would be the completion of additional site-specific environmental analysis and National Environmental Policy Act (NEPA) documentation.

The courts have determined that the issuance of a lease constitutes the point of "irreversible and irretrievable commitment of resources" that requires NEPA analysis and disclosure. This EIS is intended to provide that analysis for the lands and resources within the study area.

THE ENVIRONMENTAL IMPACT STATEMENT

This Environmental Impact Statement considers the potential site-specific impacts of the applications for competitive leases. The potential impacts addressed are based on conceptual mine plans (Figures 2-5, and 2-6).

The scope of this EIS includes, in addition to the proposed action to issue phosphate leases, the effects of connected actions and cumulative actions. Connected actions are those actions that are: (1) closely related to the proposed action and automatically triggered by the proposed action; (2) cannot or would not proceed unless other actions are taken previously or simultaneously; or (3) are interdependent parts of a larger action and depend on the larger action for their justification (40 CFR 1508.25). Cumulative actions are actions that, when viewed with other proposed actions such as timber sales, road development, wildlife habitat improvements, etc., may have cumulatively additive or concomitant significant impacts and should be discussed in the same EIS (40 CFR 1508.25).

If the decision is made to lease, issuance of a phosphate lease would grant rights to mine and develop phosphate reserves consistent with the terms and conditions of the lease. The exercising of these rights results in implementation of connected actions. However, lease issuance implies that phosphate mining and operations may take place at a future time with the identified stipulations. The regulations at 40 CFR 1508.25 require the deciding officer to consider the subsequent actions that would be part of lease development as connected actions. This would involve connected actions associated with review and approval of the mining development and reclamation plans. These actions also meet the definition of connected actions in the procedural requirements for the NEPA analysis (40 CFR 1502).

Anticipated lease development, some of which may require issuance of Forest Service Special Use Permits, is the basis of the environmental analysis from which the decision to lease or not to lease would be made. The determination on which, if any, lands would be recommended for lease and the subsequent decision of whether or not to offer a competitive lease is based upon analysis of the anticipated environmental effects of the connected actions associated with lease development.

Probable, conceptual connected actions are being considered under each alternative in this EIS. In this context, probable, conceptual connected actions include post leasing approval of mining and reclamation plan, further exploration, and issuance of Special Use Permits for off-lease activities needed to support phosphate mining and development on the lease. These actions may authorize or result in other activities such as exploration and development of facilities and transportation systems as discussed in the conceptual mine plans located in the project files and summarized in Chapter 2 - Descriptions of Alternatives of this EIS.

The process for approval of site-specific mine development and related actions would require completion of additional NEPA analyses. The NEPA site-specific analyses that may be required

would tier to the analysis documented in this EIS. The analysis summarized in this EIS is key to determining which, if any, lands would be leased and with what stipulations and mitigation requirements.

DESCRIPTION OF THE STUDY AREA

The areas to be evaluated are the entire proposed lease tracts and sufficient portions of the surrounding area that may be impacted if the decision to lease is made. The proposed lease tracts are located in southeastern Idaho near southwestern Wyoming, within the Caribou National Forest in Caribou County, Idaho. More specifically, the proposed lease tracts are located within Townships 9 and 10 South, Ranges 44 and 45 East, Boise Meridian (Figure S-1). Complete legal descriptions of the proposed lease tracts are contained in Appendix A.

The Manning Creek Tract includes parts of Manning Creek, South Fork Sage Creek, Deer Creek and the North Fork Deer Creek, and is located 15 to 20 miles southwest of Afton, Wyoming. Most of the Manning Creek Tract lies within the Sage Creek Roadless Area (04166)(USDA, Forest Service 1985a, pg. C-106 Appendix C, Forest Plan EIS).

The Dairy Syncline Tract study area includes local features known as Green Basin and Harrington Peak to the south and is about 14 miles east of Soda Springs, Idaho. The Dairy Syncline Tract lies partially within the Huckleberry Basin Roadless Area (04165) (USDA, Forest Service 1985a, pg. C-100 Appendix C, Forest Plan EIS).

Decision and Recommendations to Be Made

This EIS summarizes proposed actions concerning phosphate leasing of the Manning Creek and Dairy Syncline Tracts on the Caribou National Forest in southeast Idaho. The Forest Service and the BLM have separate responsibilities for lands and minerals within this study area and would make the following decisions and/or recommendations:

1. The Forest Supervisor of the Caribou National Forest would make a recommendation to the BLM as to which lands within the proposed lease tracts the Forest Service feels should or should not be leased.
2. The Forest Supervisor would recommend to the BLM specific lease stipulations to mitigate or reduce potential impacts to surface resources if leasing occurs.
3. The BLM would decide which lands within the proposed lease tracts would be offered for competitive leases. The BLM would also decide which surface resource stipulations and mitigation measures would be attached to the lease.

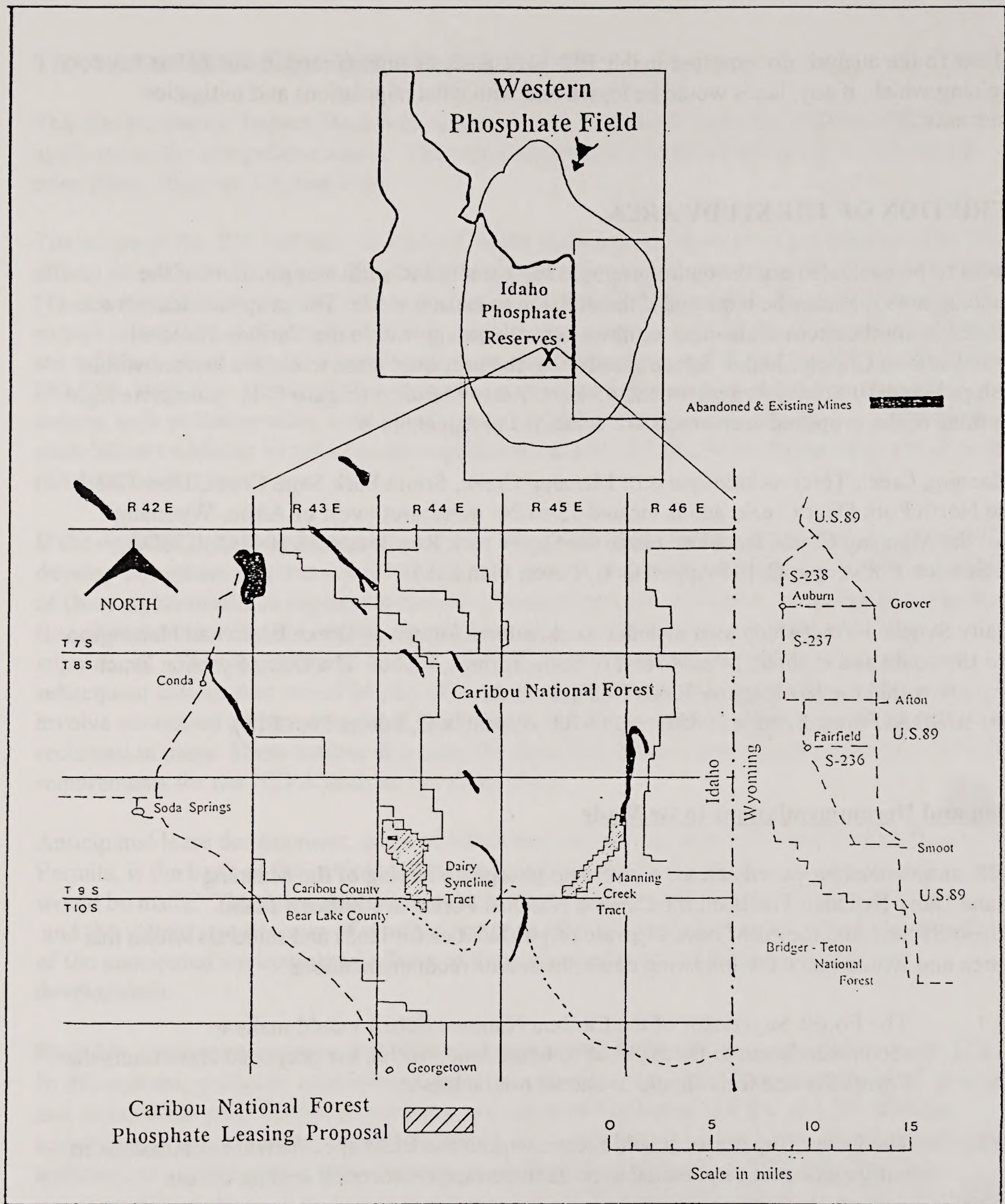


Figure S-1
Project Location Map

4. The Forest Supervisor would determine if the Forest Plan would need to be amended as a result of items one, two, and three listed above.

The Record of Decision (ROD) that will accompany the Final EIS would not make any decisions related to approval of the conceptual or any future mining and reclamation plans.

The recommendations and decisions could result in limitations on the rights granted to Federal lessees. The recommendations and decisions would provide surface resource protection on Federal lands.

SCOPING PROCESS

Integral to and initiating the environmental analysis process is the solicitation of comments from the various Federal, State, county, and local agencies, and interested organizations and individuals to assist in incorporating the most accurate and current environmental information and public opinion into planning and decision making. The initial opportunity to comment on the project was "scoping" - an information-gathering period involving agencies and the public early in the process.

A scoping document in the form of a newsletter was sent to 465 parties on the project mailing list on September 30, 1994. News releases were sent to the local newspapers, radio, and television stations before the public meetings were conducted. The purpose of the newsletter and the news releases was to inform the public that the USFS and BLM intended to complete an environmental analysis and prepare an Environmental Impact Statement (EIS). These efforts also provided information about the proposed lease tracts and solicited public comment to identify specific issues that should be addressed during the environmental planning and/or analysis process.

In addition to the newsletter, the USFS and the BLM conducted three informational meetings to inform the public of the project and to solicit comments. The meetings were held in: (1) Pocatello, Idaho, on October 18, 1994; (2) Soda Springs, Idaho on October 19, 1994; and (3) Afton, Wyoming, on October 20, 1994.

A Notice of Intent (NOI) to prepare an EIS initiating the formal 30-day scoping period was published in the Federal Register on November 11, 1994. In addition to the three informational meetings conducted in October 1994, a public scoping meeting was held in Pocatello, Idaho, on November 21, 1994. The purpose of this meeting was to provide an opportunity for agencies and the public to voice their opinions and concerns.

Comments were received from 23 attendees at the meetings held in October. There were no attendees at the formal scoping meeting held in November. In addition, written comments were received from 28 parties responding to the newsletter, NOI, newspaper legal notices, and news

releases. The comments received are part of the planning record located in the Forest Supervisor's office.

Issues

The Forest Service and the BLM reviewed, analyzed, and summarized the scoping comments and from that information, identified seven issues that are addressed in this EIS. The public (the 28 parties who provided written comment and the 23 parties who attended one of the four public meetings) was notified by a second newsletter in April, 1995 of the results of the scoping process and provided a description of the seven issues. Some comments, although important in developing this EIS, were not formulated into formal issues. These comments and rationale for not including them as EIS issues are documented in Appendix C of this EIS. The decision to lease or not to lease has not been made. Responses below may be written as if the leasing has occurred and development has proceeded on the lease Tracts. The seven issues are:

- Issue 1:** The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on the roadless area characteristics and wilderness features.
- Issue 2:** The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on backcountry recreation and hunting opportunities and experiences.
- Issue 3:** The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on wildlife and wildlife habitats including old growth vegetation.
- Issue 4:** The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on wetlands, riparian areas, water quality and fisheries in the Salt and Blackfoot River drainages.
- Issue 5:** The effects of proposed phosphate leasing and subsequent exploration, mining, and development on range livestock manageability.
- Issue 6:** The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on the social and economic elements of southeast Idaho and southwest Wyoming.
- Issue 7:** The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on the Treaty Rights of the Shoshone-Bannock Tribes.

ALTERNATIVES

The alternatives were developed in response to the issues and to ensure that a full range of leasing alternatives was addressed for each issue. The response of each alternative to the issues is documented with the description of each alternative. Alternatives were also developed in response to the requirements of NEPA to analyze a full range of alternatives that address the identified issues.

The reason for conducting this analysis is to make recommendation(s) or decision(s) in response to the purpose and need. The BLM, by accepting an application for a lease, is required by regulations to conduct an environmental analysis and respond to the applicants. Therefore, by having accepted the application the No Action Alternative is not considered viable. The effects to the surface resources would be the same for No Action as they would for No Lease; therefore, they will be treated as one alternative, No Action/No Lease, in this EIS.

The following potential development scenarios for the proposed Manning Creek and Dairy Syncline Tracts were considered but are not evaluated in detail. However, if a future developer of phosphate should propose one of these methods, the proposal would be evaluated. This is not meant to preclude these options from ever being considered in the future. They are:

A railroad line to the Manning Creek Tract or east to Star Valley was not considered because it does not appear to be economically feasible. There does not appear to be enough ore reserves on the proposed lease tract to justify the expense of constructing a railroad line for the sole purpose of transporting phosphate.

Hauling ore by truck 40 miles to a rail head at Cokeville, Wyoming, was considered; however, it would not be accomplished without construction or upgrading of existing roads. The cost of trucking ore to Cokeville, along with the necessary ore handling/processing facilities, may outweigh the value of the ore deposits in the proposed lease tract.

To transport phosphate from the Dairy Syncline Tract, a haul road or railroad was considered in Slug Creek, but shorter routes that were much less damaging to the environment are considered in the potential development scenarios.

Remoteness, costs, topographic and geographic constraints, and severe winter weather conditions may preclude the building and use of ore haul roads or conveyer belt systems to get the ore from the lease tract to existing railroad or phosphate processing plant facilities.

Five alternatives were examined in detail. Alternatives 2 through 5 each have two to four transportation scenarios. Based on the analysis contained in this EIS, these alternatives may be implemented in whole or used in part to modify another alternative with respect to one or more of the specific resources/resource areas in the final decision.

Alternative 1 - No Action/No Lease The No Action alternative is required by CEQ (40 CFR Part 1508.25) and is intended to reflect a situation where no leases would be issued. Forest Service direction for implementing the requirements of NEPA identifies two options for defining the No Action Alternative: 1) no change from current management direction or from the level of intensity, and 2) no action or activity would take place.

Under this alternative, no leasing or mining and development activity would take place on either of these proposed tracts at this time. A decision not to lease does not preclude the opportunity to evaluate the tracts for leasing again at some time in the future.

Alternative 2 - Lease Both The Manning Creek and Dairy Syncline Tracts (Proposed Action) This alternative is the proposed action. Two potential development scenarios were considered with the Manning Creek Tract, and four potential development scenarios were considered with the Dairy Syncline Tract. Under this alternative, the entire 1,920 acre Manning Creek Tract and the entire 3,259 acre Dairy Syncline Tract would be offered for competitive leasing.

Alternative 3 - Lease The Dairy Syncline Tract & Do Not Lease the Manning Creek Tract. Under this alternative, the Manning Creek Tract would not be offered for competitive leasing, and the entire 3,259 acres within the Dairy Syncline Tract would be offered for competitive leasing. Four potential development scenarios were considered with this alternative.

Alternative 4 - Lease The Manning Creek Tract & Do Not Lease the Dairy Syncline Tract This alternative would lease the entire 1,920 acres of the proposed Manning Creek Tract and would not lease any of the proposed Dairy Syncline Tract. Two potential development scenarios were considered with this alternative.

Alternative 5 - Lease Portions of The Dairy Syncline Tract and Lease Portions of the Manning Creek Tract. Under this alternative, approximately 1,120 acres within the northern portion of the Manning Creek Tract and approximately 2,142 acres within the southern portion of the Dairy Syncline Tract would be offered for competitive leasing. Two potential development scenarios were considered with the Manning Creek Tract, and four potential development scenarios were considered with the Dairy Syncline Tract.

AFFECTED ENVIRONMENT

The purpose of this section is to summarize the existing condition of the physical, biological, social, and economic resources that may be affected by the implementation of any of the alternatives. All resources relevant to this project are addressed; however, discussions focus on the resources related to the key issues. The existing condition also provides the context for assessing how the alternatives respond to the issues. The following information is presented as a

summary of Chapter 3, Affected Environment, of the Environmental Impact Statement which should be referred to for more detailed discussions.

Roadless Resources

The existing condition of the Dry Ridge, Sage Creek, and Huckleberry Basin Roadless Areas has been updated as part of this analysis process. Generally, the Roadless Area Characteristics and Wilderness Features were rated low during the RARE II inventory and the Forest Planning inventory update. Many development activities have taken place within these roadless areas since completion of the Forest Plan, and the ratings are lower now.

Meade Peak Roadless Area is not included as part of this analysis, because there would be no additional direct or indirect impacts to the area as a result of leasing and potential mining and/or potential ore transportation routes.

These roadless areas were not recommended for wilderness by the Forest Service and were not included in wilderness legislation for Idaho. During the roadless area re-evaluation, no input was received specific to these areas that recommended wilderness classification.

The Dairy Syncline Tract is considered relatively developed with many miles of existing road, past and planned timber harvest activities, a snowmobile route that transects the area, and a high level of recreational use (primarily during the Fall hunting seasons). Logging, mineral exploration, and development of roads by recreationists and woodcutters have increased access into the area.

Recreation Resources

The major recreational uses that occur in the study areas are: camping, fishing, viewing scenery and wildlife, off-highway vehicle travel, hiking, horseback riding, cross-country skiing, snowmobiling, and big game hunting. Big game hunting is a popular and major recreation activity for residents in the communities adjacent to the study areas. Rifle hunting for mule deer and elk are the most common activities. There are no developed recreation sites within either area. However, Summit View Campground is located two miles from the south end of the Dairy Syncline Tract.

Within the Manning Creek portion of the study area, the entire lease tract and most of the study area that would be affected is Semi-primitive Motorized. Within the Dairy Syncline portion of the study area, the amount of Semi-primitive Motorized classification is about one half of the area. Most of the Dairy Syncline proposed lease tract is classified as Semi-primitive Motorized.

Wildlife Resources

The Caribou National Forest (including the Curlew National Grassland) supports or contains potential habitat for approximately 350 vertebrate wildlife species including 63 mammalian species, 248 birds, 16 fish, 16 reptiles, and 7 amphibians (Forest Plan EIS, Appendix F, 1985). The Forest is widely known for its quality big game hunting for Rocky Mountain elk, mule deer, and moose, and the diversity of wildlife species that inhabit southeast Idaho.

The Manning Creek and Dairy Syncline Tracts provide suitable habitat for a variety of birds, mammals, reptiles, and amphibians. Both areas contain diverse plant communities including conifer, mixed conifer, aspen, mountain brush, and sagebrush-grass. The Manning Creek Tract is relatively unroaded and contains wildlife habitat that has not been significantly disturbed. Timber harvest (planned), mineral exploration, and livestock grazing are the primary management activities within the area. The Dairy Syncline Tract is roaded and exhibits many characteristics of human activities including habitat modifications created by logging, mineral exploration, woodcutting, dispersed camping, and livestock grazing.

Both of the lease tracts are within the Idaho Department of Fish and Game (IDFG) Big Game Management Unit 76 which is generally managed to maintain high bull to cow elk and buck to doe mule deer ratios and a large component of mature bulls and bucks. Providing quality bull elk and mule deer buck hunting opportunities is one of the IDFG's management objectives for this area. The unit contains stable populations of elk, deer, and moose. Black bear also occur within this unit, although populations are considered low.

No designated critical habitat for Threatened and Endangered (TE) wildlife species has been identified with the study area. Suitable habitat for several Intermountain Region sensitive wildlife species of concern has been identified.

Vegetation Resources

The southeast Idaho and western Wyoming areas described in this section have some common characteristics. They tend to be high elevation inland mountainous regions. The valleys in which the communities with major populations are concentrated are about 5,000 feet in elevation and contain agricultural land on which cereal grains, hay, and livestock are the most common products. Due to the high elevations, the growing seasons tend to be short. The mountain peaks reach 8,000 to 9,000 feet in elevation. Both aspen and coniferous forests occur in the higher elevations on deeper, more productive soils, especially the northerly aspects.

The mountains tend to range in elevation from 1,000 to 3,000 feet above the valleys. A typical elevation difference between valleys and mountains is about 2,000 feet. The lower elevations and south aspects, especially areas with shallow soils, tend to be dominated by grass and shrubs. As elevations increase, usually a little less than 6,000 feet above mean sea level, trees start to grow on the northerly slopes and on the more productive soils.

Old growth timber occupies 31 acres in the Manning Creek Tract and 22 acres in the Dairy Syncline Tract. Old growth classification is dependent on several characteristics such as tree size, number of trees per acre, age of the tree, tree canopy layers, tree decadence, and characteristics of dead trees.

There are no known Threatened, Endangered or Sensitive plant species within the proposed lease boundary or external facilities. However, in October, 1996 Spiranthes diluvialis was added to the Forest-wide Species (List # 1-4-96-265, File # 6118.000 and 111.000). Additional surveys would be completed for this species before surface disturbance occurred.

Biological evaluations were completed for: 1) the various timber sales harvested near the proposed lease area; 2) for range allotments; 3) for exploration for phosphate; and 4) for this EIS. A field survey for potential habitat for the three sensitive plant species known or suspected to exist on the Caribou National Forest was completed for this project. No habitat was found which would be likely to contain any of the three sensitive species.

Wetland and riparian areas are discussed in the Fisheries and Watershed Resources section.

Fisheries and Watershed Resources

Surface water within and adjacent to the Manning Creek area include Deer Creek, North Fork Deer Creek, South Fork Sage Creek and Manning Creek drainages. Certain reaches of Deer Creek, North Fork Deer Creek and South Fork Sage Creek are considered perennial. These streams usually originate from springs either in the Thaynes or Dinwoody Formation high on the Webster Range. Maximum flow in the upper reach of the streams generally occurs where they cross outcrops of the Phosphoria Formation. The streams lose flow into the Wells Formation. Drainage of the lease tract is to the east and flows into Crow Creek and then north into the Salt River which is part of the upper Snake River basin.

Manning Creek, the upper reaches of South Fork Sage Creek, and most of their tributaries are considered intermittent or ephemeral streams. However, some of these streams and tributaries may flow year-round in wet years.

The primary perennial stream draining the Dairy Syncline Tract is Slug Creek which runs 1/4 to 1 mile east of the proposed lease tract. The area is generally drained by intermittent or ephemeral streams. Springs, seeps, and small perennial streams do exist within the analysis area. Slug Creek is a principle tributary to the upper Blackfoot River. Habitat for Yellowstone cutthroat trout exists in Slug Creek; however, sampling conducted in June 1995, found no cutthroat trout present.

Habitat for finespotted cutthroat trout exists in Deer Creek, North Fork Deer Creek, South Fork of Sage Creek and Sage Creek. Presence / absence of this species was determined through

sampling conducted in June 1995. No fish species were found in the South Fork of Sage Creek. Finespotted cutthroat and Yellowstone cutthroat trout were found in Deer Creek. Electrofishing was conducted in June of 1981 for the Smoky Canyon area to look for spawning cutthroat trout in the headwaters of the Salt River system. South Fork Sage Creek was sampled (1981) from the road crossing to the Forest Service boundary only in selected pools and undercuts (Leffart, 1994). Brown trout, brook trout and sculpin were the only species identified. However, samples collected by the Idaho Fish and Game in 1975 identified the presence of cutthroat trout (Behnke, 1992 and Platts, 1975).

Yellowstone cutthroat (*Oncorhynchus clarki bouvieri*) are indigenous to the Blackfoot system. Cutthroat from several other demes have been introduced, including trout from Bear Lake and Henry's Lake and finespotted cutthroat from the South Fork Snake River, Wyoming. Biochemical genetic analysis of fish from the Blackfoot River and tributaries, however, concluded that in spite of non-indigenous introductions, no genetically distinguishable difference from the Yellowstone cutthroat could be determined (Wishard et. al, 1980).

Wetland and riparian areas are typified by sedges, rushes, and grasses. There is often a scrubby overstory of willows found along the edges of streams, ponds, in poorly drained canyons and valley bottoms, and adjacent to higher mountain springs at the headwaters. Wetlands occupy 15 acres in the Manning Creek Tract and 12 acres in the Dairy Syncline Tract.

Range and Livestock Resources

Range livestock allotments considered in this analysis include Dry Valley Cattle Allotment (with 18,590 suitable acres), Slug Creek Sheep Allotment (with 6,307 suitable acres), Manning Creek Sheep Allotment (with 5,834 suitable acres), Deer Creek Sheep Allotment #409 (with 4,098 suitable acres), Sage Creek Sheep Allotment (with 2,118 suitable acres), Stewart Canyon Sheep Allotment (with 5,970 suitable acres), Pole Canyon Sheep Allotment (with 4,088 suitable acres), Diamond Creek Cattle Allotment (with 3,542 suitable acres), and Sage Valley Cattle Allotment (with 2,100 suitable acres). Seasons of use vary; those allotments affected by the Manning Creek Tract are generally grazed from about the first of June to the end of September. Those allotments affected by the Dairy Syncline Tract are generally grazed from about June 6 to September 20. Authorized use on these allotments is about 21,684 animal unit months.

Socioeconomic Resources

The socioeconomic situation of the two counties most directly affected by the potential phosphate leases, Caribou in Idaho and Lincoln in Wyoming, are quite similar. Their physiographies are similar as are the type of jobs available and the population base. They are rural counties, sparsely populated, and highly dependent on basic industry such as agriculture, mining, and forestry.

The potential Manning Creek Lease is located such that due to the proximity to Star Valley and mountainous terrain, jobs associated directly with mining would be held by people living in Star Valley, Wyoming, rather than in Bear Lake or Caribou Counties, Idaho. If the reserves are leased, the potential for increased jobs in the mining and manufacturing sectors is small. If the J.R. Simplot Company obtains the lease, it would most likely serve to prolong the jobs of miners currently working in the Smoky Canyon Mine. Another scenario is that the new lease would be obtained by another company but probably would not be mined until after the Smoky Canyon Mine is mined out.

The larger increases in population and jobs projected in studies from the 1970's concerning increased phosphate mining have not materialized. There have been some increases in population and jobs, but the increased mining activity appears to have offset some of the out migration occurring over the same period. The mining of phosphate has probably helped stabilize the economies of the counties, and because of the higher paying jobs, the per capita income has increased.

Shoshone-Bannock Treaty Rights

Certain rights and privileges are held by members of the Shoshone-Bannock Tribe in relation to the Caribou National Forest. Off-reservation treaty rights include fishing, hunting, plant gathering, and grazing livestock.

In addition to these specific rights, Native Americans have the right to believe, express, and exercise their traditional religious practices (including having access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites). An implied right is that the habitat upon which the plants and animals rely would be protected from degradation, ensuring continuance of a supply of these plants and animals. Federal agencies such as the Forest Service have a trust responsibility to the tribes to maintain these resources in a viable and sustainable condition. Site disturbance caused by management activities is a concern, as plants could be affected, wildlife use patterns may change, a fishery could be affected, and unknown religious sites might be impacted. Oftentimes, a site is known only to certain families and not the tribe as a whole. Scoping with the tribe was done, and a meeting between the Forest Service and tribal representatives was held.

Cultural Resources

Human occupation of southeastern Idaho spans some 12,000 years or more. During the Paleo Indian period (ca. 14,500 to 7,000 B.P.), prehistoric groups traveled over vast annual ranges while hunting large migratory animals. Those animals became extinct or were reduced in number by the end of the Paleo Indian period. In the Archaic period (ca. 7,000 to 300 B.P.), groups began

exploiting a wider array of resources such as plants and fish. Ancestors of the Shoshone-Bannock Tribes most likely arrived in southeastern Idaho during the last 400 years of the Archaic period.

Euroamerican explorers and fur trappers began traveling through southeastern Idaho in the early 1800s. The Astorians were one of the first groups to travel through the area. They were followed by explorers such as Bonneville, Wyeth, Fremont, and Goodhart. Beginning in the early 1840s, large groups of emigrants traveled to Oregon via the Oregon Trail, which crosses southeast Idaho, and Mormon emigrants began to settle parts of southeastern Idaho in the early 1860s. Between the 1860s and 1890s, mining attracted a host of Euroamericans and East Asians. It also created the need for railroads and railroad workers as well as the incentive for the cattle, sheep, and service industries to come to the area.

Air Resources

Air quality of the study area is classified as attainment for all criteria pollutants by the Idaho Division of Air Quality and the Environmental Protection Agency. An attainment area is an area in which the ambient concentrations of criteria pollutants are within the limits of the National Ambient Air Quality Standards.

Visual Resources

The scenic quality of these low mountain ranges is typical or common to the area as opposed to a landscape of distinctive scenic quality. The study area consists of mountains, foothills, mountain valleys, and river plain lands accented by occasional rock formations and a variety of vegetative types. Rugged mountains or wild and scenic rivers are not found within the area, but the existing aesthetic values do provide an important scenic resource. The most common landform in the area is the foothills. Manmade intrusions within the area have an impact on the aesthetic environment.

The lower slopes are generally covered with grasses, aspen, and mountain brush. The upper slopes typically have a mix of mature lodgepole pine, Douglas-fir, and other conifers. The pattern of conifer stands is intermittent and variable. The landscape can absorb vegetation changes if new openings in the tree canopy mimic natural openings in shape and scale.

Most of the Manning Creek Tract is inventoried as middleground with Sensitivity Level 2 and Variety Class B. This results in a Visual Quality Objective (VQO) category of Modification (Forest Planning Record maps). There are about 210 acres inventoried as middleground, Sensitivity Level 2 with a Variety Class A, which results in a VQO of Partial Retention. Twenty-five acres are inventoried as foreground with a Sensitivity Level of 2 and Variety Class A, resulting in a VQO of Partial Retention. These categorizations were assigned using the National Forest Visual Management System (USDA Forest Service, 1974).

Most of the Dairy Syncline Tract is inventoried as middleground with Sensitivity Level 2 and Variety Class B. This results in a VQO category of Modification (Forest Planning Record maps). There are about 185 acres of the tract inventoried as foreground, Sensitivity Level 2 with Variety Class B, which results in a VQO of Partial Retention. These categorizations were assigned using the National Forest Visual Management System (USDA Forest Service, 1974).

Soil Resources

The Soil Survey of the Caribou National Forest, Idaho, 1990, provides generalized and detailed information for the planning area.

The affected areas of the Dairy Syncline and Manning Creek Tracks contain 13 identified soil mapping units. These soils types cover a wide range of topography from bottomlands and foothills to mountain slopes and smooth ridges. Soils found in these units are classified into several soil families. Slopes range from 0 percent to 70 percent. Mass stability ratings are from stable to marginally unstable. Erosion hazard ratings range from low to high, and cut-slope stability hazard ratings are low to moderate. Cut and fill-slope revegetation limitations would range from slight to severe.

Mineral/Geology Resources

The two areas, Dairy Syncline Tract and Manning Creek Tract, share similar soils, parent materials, and climate since they are only about seven to 12 miles apart. The soils have developed in the Middle Rocky Mountain Province typified by two major landforms: 1) The heavily forested Yellowstone Plateau of volcanic origin; and 2) the complexly folded and faulted ranges. The second grouping characterizes the landforms encompassed in the areas of concern located principally in the Aspen and Webster Mountain Ranges. The mountains are characterized by tight to open folded Paleozoic and Mesozoic sedimentary rocks. Major drainages parallel the mountain ranges and trend northwest toward the Snake River.

Drainage dissection within the two areas has been described as weak to strongly dissected. Slope distances range from 200 to as much as 3,000 feet in length. They also exhibit a wide range of landforms from gently sloping benches or depressions to convex-concave and steep canyon sidewalls. The topography is quite variable over short distances. The minable and potential phosphate resources contained within and adjacent to the Caribou National Forest contain as much as 85 percent of the high quality, easily extractable reserves in the western phosphate field. The phosphate ore is found in Permian marine phosphate deposits, specifically the Meade Peak Member of the Phosphoria Formation.

According to the geologic mapping by Moore (1994), the following features were noted within the Manning Creek and Dairy Syncline Tracts.

Manning Creek: The Meade Peak Member occurs on either side of a drainage way on east - southeast and north - northwest slopes. The beds are generally dipping to the northwest and west at angles of 5 to 40 degrees and are on the east limb of the Webster Syncline. The Deer Creek Fault cuts the southern portion of the tract. There are also numerous other smaller faults present on the tract.

Dairy Syncline: The geology of this tract is quite complex with numerous faults, folds, overturned beds, and many unknowns. The phosphate containing beds generally dip to the east in conceptual mine pit 1, are overturned and dipping from 35-73 degrees to the west in pit 2, are very gently dipping in pit 3, and dip northeast at about 8-36 degrees in pit 4.

The general project area lies adjacent to or overlies the Intermountain Seismic Belt which includes the Wasatch Front, the Bear Lake fault system into Star Valley, Wyoming, Yellowstone National Park, and the Basin and Range province of Central Idaho. On February 3, 1994, southeast Idaho and extreme western Wyoming experienced a 5.9 magnitude earthquake with its epicenter near the Idaho-Wyoming border at Draney Peak. Adjustments along the fault system continued for several months creating after shocks with a focus that migrated south of Smoot, Wyoming (Jeff Jones, 1994). Evidence indicates a history of active fault movement along the Star Valley fault periodically throughout the Quaternary period (McCalpin, 1990). Faulting is present throughout the area and is well documented in Wyoming Geo-notes No. 41, February 1994. No scientific evidence exists to link mining in the area to movement along deep seated faults. It is unlikely to have an effect when the relative weight of the ore removed for processing is compared to the total mass of the remaining overburden on the fault plates.

At present, there is very little evidence of mass movement. Engineering designs and pit development would be conducted in a manner to minimize potential failure risk.

Paleontological Resources

The Paleontological resources potentially affected by leasing and potential mining would likely occur in the upper Wells, Phosphoria, and lower Dinwoody Formations. The nature of the fossils present in these units would be almost exclusively abundant marine invertebrates. There is a chance that fossil vertebrate material (sharks and fish) could be found or disturbed.

The Grandeur Tongue of the Park City Formation could be present and disturbed by mining. If it is disturbed, numerous marine invertebrate fossils could be found. However, these fossils are common in this rock unit and have been studied. Undisturbed sections of the Grandeur are still present elsewhere, so additional studies could be undertaken if desired.

Existing Transportation Resources (roads)

Access to the proposed Dairy Syncline Tract is provided by the Slug Creek Road (#20095). This two lane graveled road provides north to south (from the Blackfoot River to Georgetown Canyon) thru access across the Forest. Caribou and Bear Lake Counties have recently acquired USDA easements for their respective sections of this road across the Forest giving them jurisdiction. This road is an important arterial route for a variety of forest and non-forest users including ranchers, loggers, miners, and recreationists. On the Caribou County side, the road is used as part of the Trail Canyon groomed snowmachine route (from the Trail Canyon Road along the Harrington Peak Road to Summit View Campground).

Current access to the Manning Creek Tract is provided by the Crow Creek Road (#20111). This road is a north to south arterial route beginning off of Highway 89 in Montpelier Canyon and connecting through to the north to Afton, Wyoming. In the vicinity of the proposed lease tract, it is a double lane graveled road. These sections through private lands are under Caribou County jurisdiction. The county has expressed interest in acquiring jurisdiction of the two mile section of this road across the National Forest near Manning Creek. This is a historic route and provides thru access for a variety of forest and non-forest users.

ENVIRONMENTAL CONSEQUENCES

This section provides a summarized description of the consequences or potential impacts to the natural, human, and cultural environments that could result from implementing each leasing alternative with associated potential exploration, mining, and development activities after mitigation measures have been applied. The following information is presented as a summary of Chapter 4, Environmental Consequences of the Environmental Impact Statement which should be referred to for more detailed discussions.

Roadless Resources

Impacts associated with past exploration, drilling, timber harvest, and other management activities have changed the roadless characteristics. Some evidence of human activities will be present for a long period. Potential phosphate mining and development activities would further affect the natural integrity, apparent naturalness, remoteness, solitude, and manageability/boundary element of the Dry Ridge, Huckleberry Basin, and Sage Creek Roadless Areas. There would be a reduction in roadless acres. Depending on the location of the development, some inventoried roadless areas would be fragmented and isolated making them too small (less than 5,000 acres) to be managed effectively as a roadless resource.

Recreation Resources

Impacts to recreation users and trails would be both direct and indirect. Direct impacts would result from disturbance caused by phosphate exploration, mining, and development in these areas. Indirect impacts would result if the disturbance was visible to the user. Recreation viewers in these areas would probably have a high sensitivity to any changes to the visual environment. Some recreationists and hunters may be displaced to other areas where the setting they desire exists for their activity placing further demands on the recreation resources in those areas.

Impacts to the Recreation Opportunity Spectrum (ROS) class were determined based upon the level of expected change in the existing classification that would result by implementing each alternative. Phosphate leasing, exploration, mining and related development in areas designated Semi-primitive Motorized (SPM) would potentially lead to a Roaded Natural (RN) classification depending on topography, vegetative cover, or density of development.

Wildlife Resources

Implementation of any action alternative would result in impacts to wildlife habitat and resources, although the potential impacts should be localized and should not affect the viability of any wildlife resources.

No designated critical habitat for Threatened and Endangered (TE) wildlife species occurs within the study area. Suitable habitat for several Intermountain Region sensitive wildlife species has been identified. Conceptual phosphate mine developments in the Manning Creek and Dairy Syncline Tracts could affect several Sensitive wildlife species due to habitat alterations and increased disturbance. The expected effects are predicted to be low to moderate in intensity and should not result in impacts that would jeopardize the continued existence of any Threatened or Endangered Wildlife species. None of the alternatives would result in a trend toward Federal listing of any Forest Service Intermountain Region Sensitive wildlife species.

Vegetation Resources

Potential mine development from all action alternatives would result in a disturbance of vegetation and ultimately change the vegetation type for possibly a long period of time following mining. There would be no affect on Proposed Endangered, Threatened, or Sensitive (PETS) plants. No current PETS plant species or their habitat exists near the proposed lease areas. However, in October, 1996 Spiranthes diluvialis was added to the Forest-wide Species (List # 1-4-96-265, File # 6118.000 and 111.000). Additional surveys will be completed for this species, before surface disturbance occurs.

Less than 1 percent of the suitable timber land base on the Caribou National Forest would be removed from production (after a mine clearing harvest) if the proposed lease tracts are mined. Removing these suitable lands from the timber base for mining purposes is consistent with the Forest Plan.

The largest area of old growth that would be affected is estimated to be 12 acres. A total of 53 acres could be affected. There would be no significant impact to the amount of old growth habitat on the Caribou National Forest as the acreage's are small and fragmented.

Fisheries and Watershed Resources

Potential sedimentation impacts from surface disturbance would vary among alternatives depending on the area disturbed and the potential for sediment to be transported to streams. The potential for silt and sediment loading in streams is high, but mitigation measures would minimize this potential. During the first two years of project construction activities, removal and storage of overburden would create potential for erosional events, particularly during snowmelt and storm water runoff. Mitigation measures would reduce or eliminate this potential. Preventative measures include the Best Management Practices as outlined in Idaho (1992). Regardless of measures taken, periods of elevated levels of suspended sediments would occur during initial construction, road building/improvements, timber harvest, and earthmoving activities in the headwaters, especially during high water events. These events would have the greatest risk of violating the State Water Quality Standards and impacting the aquatic environment. With proper drainage and sediment control structures regulated by Federal and State standards, the risk of long-term impacts to fisheries varies between the action alternatives.

No Threatened or Endangered fish species are known to occur in streams within the Manning Creek and Dairy Syncline Tracts. The finespotted cutthroat trout has been identified within the proposed Manning Creek Tract. Special consideration for the protection and conservation of the finespotted cutthroat trout, which is a Forest Service sensitive species, is a high priority.

Implementation of 300-foot riparian habitat conservation areas where possible on each side of live water streams (Deer Creek, North Fork of Deer Creek and South Fork of Sage Creek) and the protection or mitigation of 12 acres of wetlands in the Green Basin area of the Dairy Syncline Tract causes the alternatives to be consistent with the Forest Plan. The Deer Creek drainage could be an exception.

If leasing and subsequent mine development occur in the proposed Manning Creek Tract, adverse impacts to finespotted cutthroat trout could occur. Adverse impacts to the fish and their habitat in the northern portion of this proposed lease tract (near the South Fork of Sage Creek) would likely be minor when proper mitigation measures are applied. If this tract is leased and development is a continuation of the existing Smoky Canyon mine, the South Fork of Sage Creek may need to be crossed by a haul road. Such a crossing would increase the impacts to the fishery. Development of

the southern portion of the proposed Manning Creek Tract, as shown in the conceptual mine plan (Fig 2-5) would almost certainly affect finespotted cutthroat trout and/or their habitat in Deer Creek and the North Fork of Deer Creek even after mitigation.

Alternatives 3 and 5 do not involve the leasing of the southern portion of the proposed Manning Creek Tract, therefore, they would be in conformance with the Forest Plan for the Deer Creek drainage area.

Alternatives 2 and 4, which would lease and allow development in the Deer Creek and North Fork of Deer Creek drainage, most likely would not be consistent with the Forest Plan. The conceptual plan is not sufficiently detailed to specifically evaluate all of the potential impacts to the finespotted cutthroat trout and their habitat. That evaluation would have to be done at the mine plan approval stage, if leasing occurs. A Forest Plan amendment would probably be necessary at the mine plan approval stage.

Range and Livestock Resources

Effects and/or impacts on grazing and livestock production would be much greater or much less depending on which alternative is implemented. Conceptual mine development of the Manning Creek Tract would result in an estimated potential reduction during operations and until reclamation is complete and impacted lands are returned to use of suitable range of 274 to 4,486 acres. The exact acres would depend on the Alternative and potential development scenario considered. This would result in a reduction of 130 to 2,126 Animal Use Months for the impacted allotments.

Conceptual mine development of the Dairy Syncline Tract would result in the reduction of suitable range of 633 to 695 acres depending on the Alternative and potential development scenario considered. This would result in the potential reduction of 152 to 167 Animal Use Months (AUM).

There may be an opportunity to relocate some or all of these AUM's lost on the Deer Creek Allotment to a vacant allotment located south of the Dairy Syncline Tract.

Socioeconomic Resources

The leasing of these tracts would not likely increase employment or population in the study area. Not leasing these tracts would have the potential to increase or decrease employment and income to local communities. If the Manning Creek Tract is not leased and existing mining operations move to the west, miners would probably not continue to live in Star Valley. Thus, Star Valley would be affected with a decrease in jobs and income. If existing mines move to the west, most likely growth would occur in Caribou County, Idaho. Leasing the Manning Creek and Dairy

Syncline Tracts would be more likely to stabilize jobs within the region and local communities and production rather than increase jobs and production (Personal communications with mine managers (Conry, 1995; Clark, 1995 and Mapes, 1995)). The U.S. Geological Survey estimates that there are 1.038 billion tons of phosphate rock in Idaho. Therefore, it is assumed that if these sites are not leased and mined, other existing leases would be developed. There are no plans for additional leases now; it takes several years to get new leases issued. It can take a few years to acquire mine approval. A break in production would impact a company's ability to function. These are among the largest tracts of unleased phosphate. Exploration of other sites is already taking place (Personal communications with Jeff Jones, Soda Springs Ranger District 12/11/95). Further exploration within the phosphate field is an on-going process.

A recent study from Idaho State University (Benson and Stegner, 1995) projects population growth rates in Bannock and Caribou Counties in Idaho and Lincoln County in Wyoming at 2.5 to 10.5 percent every five years until 2015. They project that the numbers of jobs in mining and manufacturing would increase slightly over the next 20 years. Benson and Stegner (1995) state, "if mining continues at the current rate, and technologies do not change, these reserves would last about 145 years."

The economic impacts of shifting mine locations are not expected to be significant on the counties. As stated above, there would be an impact on local communities. The flow of monies to the counties is expected to continue with some increases and declines that are related to demand for phosphate rather than to the ability to lease a given ore body.

Shoshone-Bannock Treaty Rights

Management activities can alter the environment which could affect treaty rights of Native Americans. Any activity that reduces viable populations of fish, wildlife, or plants can directly affect the ability of tribal members to exercise treaty guaranteed rights to hunt and gather these resources for cultural activities including ceremonial and subsistence.

Federal agencies such as the Forest Service have a trust responsibility to Indian tribes to maintain natural and cultural resources in a viable and sustainable condition. Management activities that result in the disturbance of sites could affect fish and wildlife habitat, plant communities, and known as well as unknown Native American religious sites.

Cultural Resources

Each of the action alternatives propose leasing that could result in land disturbing activities to varying degrees. Consequently, the integrity of any cultural resource (i.e., archaeological or historical sites and sacred and traditional use locations) which may be present in the leasing tracts could be compromised by such activities. To conform with the Forest Plan and to comply with

Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended, the Forest Service, prior to any surface disturbance, would need to "make a reasonable and good faith effort to identify historic properties that may be affected by the undertaking and gather sufficient information to evaluate the eligibility of these properties for the National Register" (36 CFR Part 800.4[b]). This effort would be accomplished by conducting an archaeological survey of the uninventoried areas that would be disturbed.

Air Resources

All action leasing alternatives with their potential for subsequent exploration, mining, and development could affect the level of air contaminants of the ambient air quality. All activities would require air quality permitting by the Idaho Division of Environmental Quality (DEQ). None of the action alternatives would be allowed to cause a new violation of the National Ambient Air Quality Standards (NAAQS) or Prevention of Significant Deterioration (PSD) of air quality increments (the increments are not checked unless a PSD permit is issued). The impacts could be determined by dispersion modeling.

All action alternatives could affect visibility in the study area. Visibility impacts are especially important in Class I areas. The nearest Class I area is Grand Teton National Park which is less than 100 miles by air from the study area. The visibility screening procedure consists of three levels of analysis. The first level is a very basic screening model. If visibility impairment is predicted by the level one analysis, a level two screening would then be done for a more thorough analysis of the case in question. If the level two screening shows impairment, then a level three screening would be done. If the level three screening shows impairment, then mitigation would be needed for Class I areas.

A level one visibility screening analysis has been completed for a phosphate mine using distances of 30 (radius of impact) and 100 miles. The analysis shows that screening criteria are exceeded at 30 miles but not at 100 miles. No further screening would need to be done since there is not a Class I area within 30 miles of the proposed lease tracts. The screening analyses are included as Appendix C of the Air Quality Resource Report in the project files in the Forest Supervisor's office.

If mining and development follow leasing, all action alternatives would produce ground-level emissions which include fugitive dusts from mining equipment and emissions of all criteria pollutants from Internal Combustion (IC) engines. All action alternatives would require the operators to comply with State of Idaho regulations and the Federal Clean Air Act. A dust abatement plan would be required as part of a specific mining plan.

Visual Resources

Potential impacts to visual resources associated with phosphate leasing and subsequent mining and development could occur. Changes in Visual Quality Objectives (VQO) based on the effects on scenic quality and viewer sensitivity might be necessary.

Phosphate exploration, mining development, access roads, and dust that cause visual changes in the landscape and a change in VQO would directly affect the visual resources of the study area. The natural landscapes in the study area are moderately diverse but are not complex (form, line, color, and texture); however, the landscape would have some ability to absorb manmade changes within the landscape. The abilities for the landscape to absorb some change in certain locations for certain types of development make it possible to comply with VQO in some parts of the study area and not in other parts.

Phosphate exploration, mining and development activities, including road construction, would likely result in high to moderate visual impacts. Where these activities are visible in the foreground from Sensitivity Level 2 views (e.g., recreation use areas, trails, and travel roads), strong visual contrasts would result in high impacts. Mining and development activity within foreground or middleground distance zones in areas of VQO Partial Retention (especially in areas of Variety Class A) would not meet this VQO. From a distance of several miles, the potential disturbance of mining and development would be visible within the context of the surrounding landscape, however; the equipment would not be visible. Visual impacts from all phases of mining and development may be partially reversed when reclamation of the sites has been completed.

Soil Resources

Direct effects of potential phosphate exploration, mining, and development from all action alternatives are usually associated with road construction, waste areas, and development of the mining pits. All of the action alternatives could increase the potential for surface erosion. Each of the action alternatives could result in the development of the pits and construction of roads. Road surfaces can be stabilized with rock; however, ditches, cut and fill slopes, and soil below drainage structures can be difficult to stabilize with vegetation. Erosion hazards associated with road construction increase as the slope of the traversed hillside increases. Steeper slopes result in more soil and substrate being exposed to erosive forces and provides increased potential for cut or fill slope failure. Roads on steeper slopes also displace greater quantities of material that must be sidecast or hauled away. Waste areas present the greatest threat of sediment delivered to streams by virtue of their position on the landscape and length of time required for vegetative erosion protection. The construction of silt ponds would reduce or eliminate this potential threat.

Direct effects to groundwater include interception and/or interference of water movement within the soil mantle which may change runoff, timing of peak flows, and runoff volumes. The amount

of surface area devoted to buildings, pavement, or roads would increase surface runoff. In addition, each of the associated facilities (tailings line, for example) would require some road or trail construction to facilitate the building process.

Mineral/Geology Resources

Preliminary conservative estimates indicate there are approximately 20 million tons of phosphate ore in the Dairy Syncline Tract and from 20 million to 50 million tons (about 30 million tons being the most probable estimate) for the Manning Creek Tract. The potential pit sizes range from 271 to 591 acres for the Manning Creek Tract and 490 to 650 acres for the Dairy Syncline Tract. Phosphate ore that is removed represents an irretrievable commitment of a non-renewable resource.

Within the next decade, all of the companies except Simplot, have mine plans which can be expected to come on-line. Monsanto has a plan submitted for the South Rasmussen Ridge Mine (I-23658) which would come on-line in 2001. Agrium (Nu-West) has a contract with Rhone-Poulenc (I-04575) through the year 2005 and maybe longer. FMC will be moving south into its Panels C and D of Dry Valley (lease I-015097). Without additional leasing, Simplot's ore would have to come from existing leases in either the northern and eastern portions of the Boulder Anticline (I-012890), the Sulphur Peak area (I-01603) or possibly upper Blackfoot River drainage. Under Alternative 1, mining activities would not be likely within the Manning Creek/Deer Creek or Slug Creek drainages.

Geologic impacts resulting from the possible construction of mill sites, access and haul roads, power transmission lines, and tailings lines are considered negligible. Relatively small areas would be affected, and the change in surface contour would be minimal. All facilities associated with the project would be removed and the areas reclaimed after the completion of mining in the area.

Paleontological Resources

It is possible that construction of ore transportation or other surface facilities would impact paleontological resources. However, because of the geological units likely to be disturbed and the paleontological characteristics of these units, the proposed mitigation measures should be adequate to prevent significant impacts.

Existing Transportation Resources (roads)

There would be impacts to the existing transportation system if the Manning Creek and Dairy Syncline Tracts are leased and developed as described under one of the potential development scenarios described in Chapter 2. Some of the current road system would be crossed, severed,

and/or obliterated by the potential mine development and ore transportation scenarios. This would affect a variety of current users including permittees, loggers, and dispersed recreationists.

CHAPTER 1 - PURPOSE AND NEED

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PURPOSE AND NEED

Two applications have been filed for competitive lease sales for Federal phosphate rights on 3,179 acres within the Carson National Forest. These applications have been filed with the Bureau of Land Management in accordance with the Federal Leasing Act of 1920 (As amended) and applicable regulations. These proposed lease tracts are referred to as the Manning Creek Tract (encompassing about 1,920 acres) and the Dairy Service Tract (encompassing about 1,259 acres). The Carson National Forest (Forest Service) and the Bureau of Land Management (BLM) are required by Federal Regulation to respond to these applications. The Forest Service must make recommendations as to the BLM, and the BLM must make a decision and respond to the lease applications. The recommendation to be made by the Forest Service is whether or not to lease and if so, with what stipulations. The decision to be made by the BLM is whether or not to lease the phosphate reserves within the Dairy Service and Manning Creek Tracts should be offered for competitive leasing, and if leased, what stipulations are necessary to help protect the phosphate reserves and protect the surface and subsurface resources.

Some mining companies are running out of phosphate reserves and are asking for more. R. R. Simpson Company and No-Wen Industries requested that these two tracts be offered for leasing.

There is a shortage of phosphate throughout the United States and the world. Phosphate is used along with nitrogen, potassium and other minerals to grow plants and crops. It is also important to human health. In fact, the elemental phosphorus and combined phosphorus in human bodies is in phosphate. (USDA - USGS, BLM & USDA Forest Service, 1977)

The heart of the Western Phosphate Field lies within the Carson National Forest boundaries. Prospecting has been completed in recent years to locate the phosphate reserves within the boundaries of the proposed lease tracts. Federal phosphate leases are offered under the 1920 Mineral Leasing Act. It is intended to permit the mining and development of the phosphate deposits. The role of the Forest Service is to make a recommendation as to whether or not to lease, with what stipulations, and whether or not to lease for competitive exploration, development, and production of mineral and energy resources on Federal Forest System lands is an extremely difficult task. The BLM is to help meet the present and future needs of the Nation. The Federal Leasing Act for the BLM is to make leasing decisions and to be the lease leasing agency for leasing Federal lands, including those found in National Forest System lands.

The granting of a competitive phosphate lease gives the lessee the right to mine and develop the phosphate reserves within the lease. This right is subject to review and approval as the specific lease development plans are submitted by the lessee.

The Forest Plan for the Carson National Forest provides for mineral leasing and development. (USDA - 1978, pp. 11-20 and 11-21). The plan states:

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Two applications have been filed for competitive lease sales for Federal phosphate rights on 5,179 acres within the Caribou National Forest. These applications have been filed with the Bureau of Land Management in accordance with the Mineral Leasing Act of 1920 (as amended) and applicable regulations. These proposed lease tracts are referred to as the Manning Creek Tract (encompassing about 1,920 acres) and the Dairy Syncline Tract (containing about 3,259 acres). The Caribou National Forest (Forest Service) and the Bureau of Land Management (BLM) are required by Federal Regulation to respond to these applications. The Forest Service must make recommendations to the BLM, and the BLM must make a decision and respond to the lease applications. The recommendations to be made by the Forest Service are whether or not to lease and if so, with what stipulations. The decision to be made by the BLM is which, if any, phosphate reserves within the Dairy Syncline and Manning Creek Tracts should be offered for competitive leasing, and if leased, what stipulations are necessary to help mitigate anticipated impacts or to protect the existing surface and subsurface resources.

Some mining companies are running out of phosphate reserves on their existing leases. J.R. Simplot Company and Nu-West Industries requested that these two tracts be offered for leasing.

There is a continuing need for phosphate throughout the United States and the world. Phosphate, along with nitrogen, potassium and other minerals, is vital to plant growth. It is also important to human nutrition. In both its elemental state and combined chemical form, it is widely used in agriculture and industry (USDI - USGS, BLM, & USDA Forest Service, 1977).

The heart of the Western Phosphate Field lies within the Caribou National Forest boundaries. Prospecting has been completed in recent years to validate the presence of phosphate within the boundaries of the proposed lease tracts. "Federal Phosphate Leases" are offered under the 1920 Mineral Leasing Act (as amended) to permit the mining and development of these phosphate deposits. The mission of the Forest Service in relation to minerals management is to support, facilitate, and administer the orderly exploration, development, and production of mineral and energy resources on National Forest System lands in an environmentally acceptable manner to help meet the present and future needs of the Nation. The Federal leasing laws require the BLM to make leasing decisions and to be the lease issuing agency for leasable Federal minerals, including those found on National Forest System Lands.

The issuance of a competitive phosphate lease conveys to the lessee the right to mine and develop the phosphate reserves within the lease. This right is subject to review and approval as site-specific mine development plans are submitted by the lessee.

The Forest Plan for the Caribou National Forest provides for mineral leasing and development (USDA - 1985, pgs. III-20 and III-21). The Plan states:

"Mineral resources on the Forest that can be produced at a profit, after consideration of the costs of mitigating measures necessary to protect surface resource values, would be produced to meet demands."

Standards and guidelines for Mineral and Energy Resources are found on pages III-59 through III-64 of the Forest Plan. The key Standards and Guidelines are summarized in Appendix F.

The Forest Service and the Bureau of Land Management have jointly determined that an Environmental Impact Statement is necessary to assess and document the anticipated site-specific environmental impacts of leasing and potential subsequent mine development of these two proposed Federal phosphate tracts.

The courts have determined that the issuance of a lease constitutes the point of "irreversible and irretrievable commitment of resources" that requires NEPA analysis and disclosure. This EIS is intended to provide that analysis for the lands within the study area. Any measures intended to mitigate reasonably foreseeable impacts on surface resources should be attached to the lease at the time it is issued. Consequently, the identification of mitigation measures and their application in the recommendation by the Forest Service to lease specific lands and the final decision of the BLM to offer lands for competitive phosphate lease is of great importance in this EIS.

THE ENVIRONMENTAL IMPACT STATEMENT

This Environmental Impact Statement considers the potential site-specific impacts of the issuances of competitive leases. The potential impacts addressed are based on conceptual mine plans provided by the lease applicants. These conceptual mine plans were used to determine anticipated impacts of leasing and subsequent potential mine development.

The scope of this EIS includes, in addition to the proposed action to issue phosphate leases, the effects of connected actions and cumulative actions. Connected actions are those actions that are; 1) closely related to the proposed action and automatically triggered by the proposed action; 2) cannot or would not proceed unless other actions are taken previously or simultaneously; or 3) are interdependent parts of a larger action and depend on the larger action for their justification (40 CFR 1508.25). Cumulative actions are actions that when viewed with other proposed actions such as timber sales, wildlife improvements, and mineral related activities, may have cumulatively significant impacts and should be discussed in the same EIS (40 CFR 1508.25).

If the decision is made to lease, the issuance of a phosphate lease grants a right to mine on leased phosphate reserves consistent with the terms and conditions of the lease. The exercise of these rights results in implementation of connected actions. The regulations in 40 CFR 1508.25 require the deciding officer to consider the subsequent actions that would be part of lease development as connected actions. This would involve connected actions associated with review and approval of the mining development and reclamation plans. These actions also meet the

definition of connected actions in the procedural requirements for the NEPA analysis (40 CFR 1502).

Anticipated exploration and lease development are the basis of the environmental analysis from which the decision to lease or not to lease will be made. Other connected actions that would occur outside the lease boundary would be authorized by the issuance of a USFS Special Use Permit. The determination on which, if any, lands would be recommended for lease and the subsequent decision of whether or not to offer a competitive lease is based upon analysis of the anticipated environmental effects of the connected actions associated with lease development.

Connected actions are being considered under each alternative in this EIS. In this context, connected actions include post-leasing approval of a mining and reclamation plan and further exploration and issuance of Special Use Permits for off-lease activities needed to support phosphate mine development. These actions may authorize other activities such as drilling, construction of shops, offices, roads, railroads, power lines, conveyer systems, and slurry pipelines as discussed in the conceptual mine plans located in the project files and summarized in Chapter 2 - Descriptions of Alternatives of this EIS.

The process for approval of site-specific mine development and related actions would require completion of additional NEPA analysis. The site-specific NEPA analyses that may be required would tier to the analysis documented in this EIS. The analysis summarized in this EIS is key to determining which, if any, lands would be leased and the appropriate stipulations and mitigation requirements.

DESCRIPTION OF THE STUDY AREA

The areas to be evaluated are the entire proposed lease tracts and the surrounding area that may be impacted if the decision to lease is made. The proposed lease tracts are located in southeastern Idaho within the Caribou National Forest in Caribou County, Idaho. More specifically, the proposed lease tracts are located within Townships 9 and 10 South, Ranges 44 and 45 East, Boise Meridian (Figure 1-1). Complete legal descriptions of the proposed lease tracts are contained in Appendix A.

The proposed Manning Creek Tract is within 006 Crow Creek Management area, and the Dairy Syncline Tract is within 016 Blackfoot Management Area of the Caribou National Forest Land and Resource Management Plan (Forest Plan). The management of solid leasable minerals is also discussed in the BLM's Idaho Falls District Pocatello Resource Management Plan. These Resource Management Plans provide direction for management of the surface resources on National Forest System Lands and the associated Federally owned minerals are provided for in the BLM plan. The pertinent management direction is summarized in Appendix F of this EIS.

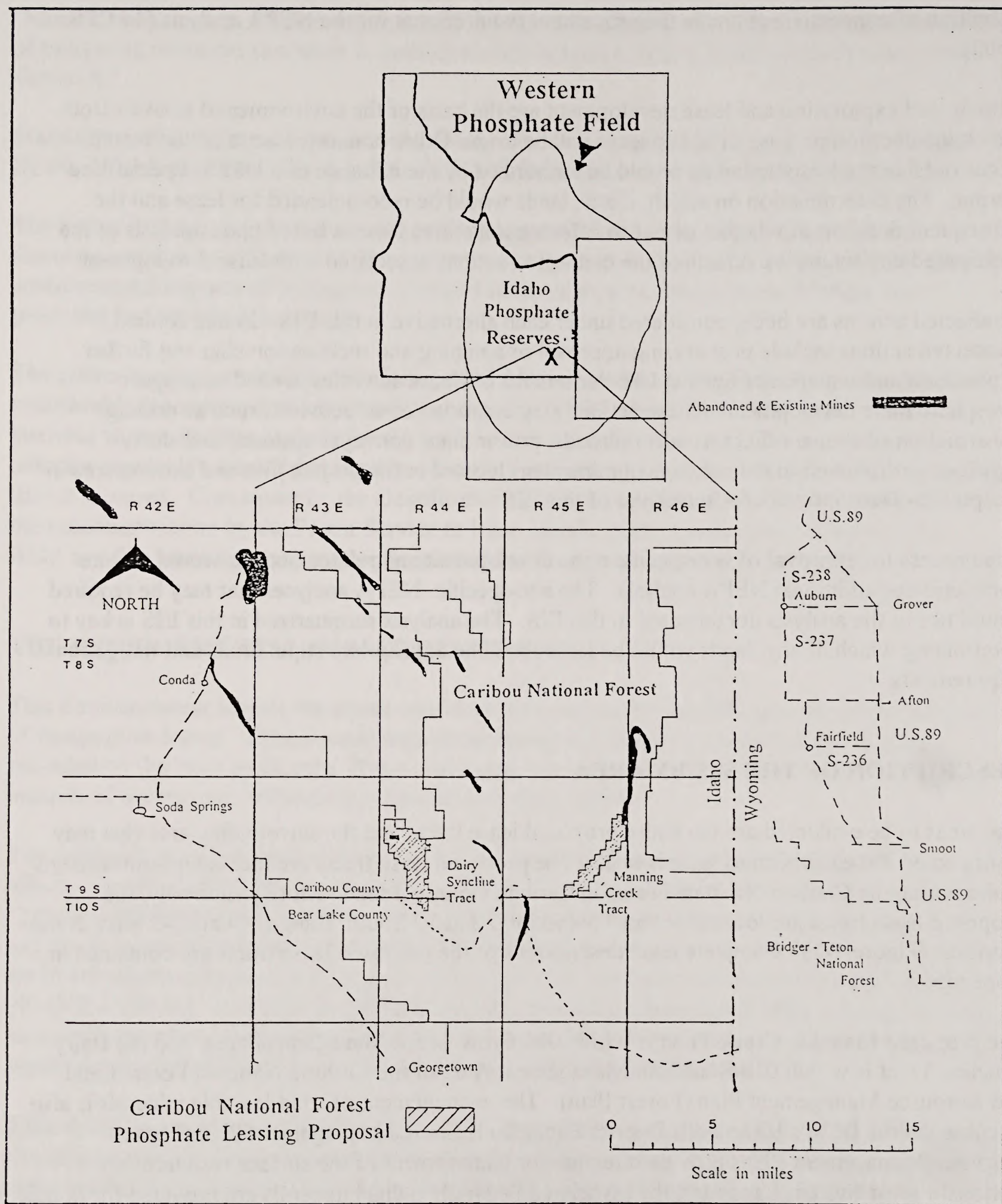


Figure 1-1
Project Location Map

The Manning Creek Tract includes parts of Manning Creek, South Fork Sage Creek, Deer Creek and the North Fork Deer Creek and is located 15 to 20 miles southwest of Afton, Wyoming. Most of the Manning Creek Tract lies within the Sage Creek Roadless Area (04166) (USDA 1985b, Appendix C, Forest Plan EIS).

The Dairy Syncline Tract study area includes local features known as Green Basin and Harrington Peak to the south and is about 14 miles east of Soda Springs, Idaho. The Dairy Syncline Tract lies within the Huckleberry Basin Roadless Area (04165) (USDA 1985b, pg. C-106 Appendix C, Forest Plan EIS).

AUTHORIZING ACTIONS AND RELATIONSHIP TO STATUTES, REGULATIONS AND OTHER PLANS

Leasable public domain minerals (those which have never passed out of Federal ownership) are leased under authority of the Mineral Leasing Act of 1920, as amended. The phosphate deposits within the proposed lease tracts are public domain minerals.

Decision and Recommendations to Be Made

The Forest Service and the BLM have separate responsibilities for lands and minerals to make the following decision and/or recommendations for this study area:

1. The Forest Supervisor of the Caribou National Forest would recommend to the BLM which lands within the proposed lease tracts should be leased and which should not be leased.
2. The Forest Supervisor would recommend to the BLM specific lease stipulations to mitigate or reduce potential impacts to surface resources if leasing occurs.
3. The BLM would decide which lands within the proposed lease tracts would be offered for competitive leases. The BLM would also decide which surface resource stipulations and mitigation measures would be attached to the lease.
4. The Forest Supervisor would determine if the Forest Plan would need to be amended as a result of items 1, 2, and 3 as listed above.

The Record of Decision (ROD) will that accompany the Final EIS would not make any decisions related to approval of the conceptual or future mining and reclamation plans.

The recommendations and decision could result in limitations on the rights granted to Federal lessees. The recommendations and decision would provide surface resource protection on Federal lands.

A series of statutes establish and define the authority of the Forest Service and the BLM. These are described in Appendix B. Table 1-1 summarizes the permits, licenses, and approvals potentially required before mining would be permitted but may not be required at this leasing stage.

Table 1 - 1 Permits, Licenses, and Approvals Potentially Required for Mine Projects

| Permit, License, or Approval | Purpose |
|--|---|
| Forest Service | |
| Recommendations for mining and reclamation plans. (43 CFR 3590) | FS to provide recommendations on mining and reclamation plans and leasing actions to the BLM |
| Cultural Resource Clearance (National Historic and Archeological Resources Protection Act) | To obtain joint approval by the U.S. Forest Service and State Historic Preservation Office prior to land disturbing activities. |
| Final Design Approval of Facilities | To ensure consistency of design of plant/portal site, conveyor system, haul roads, railroads, slurry lines, waste rock disposal site, access roads, utility corridors, waste water treatment facilities, and tailing disposal impoundment and preliminary plans. Coordinate with State of Idaho Department of Lands and appropriate agencies. |
| Special Use Permits (36 CFR 251.1) | To allow for the orderly development of facilities and infrastructures located off of the lease through the issuance of Special Use Permits. |
| Bureau of Land Management | |
| Offer Competitive Leases for Sale (43 CFR 3500) | To control and manage the Federally owned mineral resources to receive fair market value and to protect the environment. |
| (43 CFR 3590) | Exploration and mine plan approval. |

Table 1-1 Continued

U.S. Fish and Wildlife Service

| | |
|-------------------------------------|---|
| Biological Assessment Determination | To comply with the Endangered Species Act. If it is determined adverse effects would occur to threatened or endangered species as a result of the project, the agencies would consult with the U.S. Fish and Wildlife Service to design measures to protect the affected species. |
|-------------------------------------|---|

Army Corps of Engineers

| | |
|------------------------------|---|
| 404 Permit (Clean Water Act) | To control discharge of dredged or fill material in waters of the United States or on wetlands. |
|------------------------------|---|

Department of State Lands

| | |
|---|--|
| State Operating Permit (Surface Mine Reclamation Act) | To allow bonded mining development activity. |
|---|--|

State Historic Preservation Office

| | |
|--------------------------------|--|
| Review for cultural compliance | To comply with cultural resource regulations. If historical, archaeological, or other cultural resources are located in the project area, the State Historic Preservation Officer (SHPO) would advise the Caribou National Forest on impact mitigation on sites eligible for nomination to the National Register of Historic Places. |
|--------------------------------|--|

Idaho Department of Labor and Industrial Services

| | |
|--|---|
| Building, Electrical, and Plumbing Permits | To ensure compliance with the Uniform Building Codes and Electrical and Plumbing Codes. |
|--|---|

Idaho Department of Health and Welfare

| | |
|---------------------------------------|--|
| Air quality permit to operate a mine. | To control emissions of particulate and emissions from on-site sources. To ensure compliance with State Air Quality Standards under the rules of the Federal Clean Air Act |
|---------------------------------------|--|

Idaho Department of Water Resources

| | |
|---|---|
| Change in Quality of Ambient Waters (Water Quality Act) | To control discharge to groundwater and surface water in accordance with non-degradation requirements and meet State Water Quality Standards. |
| Permit to Appropriate Water (Idaho Code 42-202) | To control the use and appropriation of water within the State of Idaho. |

Table 1-1 Continued

Permit to alter stream channels
(Idaho Code 42-380)

To issue permits to alter stream channels. To protect
streams and channels from unnecessary or improper
alterations.

LAND MANAGEMENT RELATED TO PHOSPHATE MINE DEVELOPMENT

Forest Plan Context

Management of each administrative unit of the National Forest System (one or more National Forest(s) or National Grassland(s)) is governed by a Land and Resource Management Plan (Forest Plan). Most of the existing Forest Plans include general decisions as part of management prescriptions to provide for mineral leasing but do not include decisions for leasing specific lands. Certain leasing alternatives (with attendant mine development) would require an amendment to the Forest Plan. This EIS would identify where action alternatives cannot meet Forest Plan Standards and Guidelines.

Administration

The Secretary of the Interior is directly responsible for administering the Mineral-Leasing Act. The minerals-management objectives of the Department of the Interior are for; 1) orderly and timely resource development; 2) protection of the environment; 3) the receipt of fair market value for disposition of the mineral resources; and 4) to ensure non-waste of minerals. The BLM has been delegated administrative and management responsibilities for the Mineral Leasing Act and for the Department operating programs.

The BLM decides whether leases, licenses, or permits would be issued, and is the office of record in mineral-leasing matters for the Federally owned phosphate resources in Idaho. The BLM is also responsible for approving /disapproving lease, license, and/or permit operations and for all geological, engineering, and economic-value determinations which include the classification of lands for lease, license, or for permit and the setting of rental and royalty rates and other terms and conditions contained in a permit, license, or lease. The Forest Service issues and administers Special Use Permits for off lease activities associated with development.

The BLM formulates the general requirements in leases, licenses, and permits for protecting the surface and non-mineral resources and for reclamation and also reviews and approves/disapproves mining, exploration and reclamation plans.

The Forest Service is responsible for managing the National Forest surface resources in accordance with Federal statutes and directives of the Secretary of Agriculture. This includes

advance consideration of the effects of issuing phosphate leases. Before phosphate permits, licenses, or leases on National Forest System Lands are issued, the Forest Service makes recommendations to the BLM. These recommendations are for special stipulations on the leasing, licensing, or permits for protecting surface, non-mineral resources, and reclamation. The Forest Service consults with the BLM in all matters regarding permits, licenses, and leases on National Forest System Lands and issues and administers Special Use Permits for off-lease activities.

CHAPTER 2 - ALTERNATIVES

CHAPTER 2 - ALTERNATIVES

INTRODUCTION

Early in the project, it was recognized that the project would be a complex one, involving many different agencies and organizations. The project was divided into several phases, and the first phase was to develop a conceptual framework for the project. This framework was developed in response to the need for a common understanding of the project's goals and objectives. The framework was developed in response to the need for a common understanding of the project's goals and objectives. The framework was developed in response to the need for a common understanding of the project's goals and objectives.

The second phase of the project was to develop a conceptual framework for the project. This framework was developed in response to the need for a common understanding of the project's goals and objectives. The framework was developed in response to the need for a common understanding of the project's goals and objectives. The framework was developed in response to the need for a common understanding of the project's goals and objectives.

SCOPING PROCESS

Integral to and central to the environmental analysis process is the solicitation of comments from the various Federal, State, County, and local agencies, organizations, and individuals. These parties are invited to participate in the project's scoping process. The scoping process is a key component of the project's overall process. The scoping process is a key component of the project's overall process. The scoping process is a key component of the project's overall process.

A scoping document is the first of a series of documents that are developed during the project. The scoping document is the first of a series of documents that are developed during the project. The scoping document is the first of a series of documents that are developed during the project. The scoping document is the first of a series of documents that are developed during the project. The scoping document is the first of a series of documents that are developed during the project.

In addition to the scoping document, the project also developed a series of other documents. These documents include the project's environmental impact statement, the project's environmental impact assessment, and the project's environmental impact report. These documents are developed in response to the need for a common understanding of the project's goals and objectives. These documents are developed in response to the need for a common understanding of the project's goals and objectives. These documents are developed in response to the need for a common understanding of the project's goals and objectives.

A series of public meetings were held during the project's scoping process. These meetings were held in response to the need for a common understanding of the project's goals and objectives. These meetings were held in response to the need for a common understanding of the project's goals and objectives. These meetings were held in response to the need for a common understanding of the project's goals and objectives.

CHAPTER 2 - ALTERNATIVES

CHAPTER 2 - ALTERNATIVES

INTRODUCTION

Early in the project, comments regarding this proposal were solicited from appropriate agencies, specific individuals, and the general public. The comments received were analyzed and summarized to represent the issues and concerns of the respondents. Based on and in response to the issues, the Forest Service and BLM developed a range of alternatives that meet the purpose of and need for the project (as identified in Chapter 1). The alternatives propose a range of specific actions that could be implemented and provide alternate decisions on; 1) which lands could and could not be offered for competitive leasing; and 2) what mitigation measures (later in this Chapter) should be attached to the lease as stipulations.

This chapter describes the scoping process, the seven issues identified during scoping, the development of alternatives, each alternative and conceptual mine plans (reasonably foreseeable development) anticipated for each tract, and provides a comparison of the alternatives.

SCOPING PROCESS

Integral to and initiating the environmental analysis process is the solicitation of comments from the various Federal, State, county, and local agencies, interested organizations, and individuals. These parties assisted in incorporating the most accurate and current environmental information and public opinion into planning and decision making. The initial opportunity to comment on the project was "scoping" - an information-gathering period involving agencies and the public early in the process.

A scoping document in the form of a newsletter was sent to the 465 parties on the project mailing list on September 30, 1994. News releases were sent to the local newspapers and radio and television stations before the public meetings were conducted. The purpose of the newsletter and the news releases was to inform the public that the Forest Service and BLM intended to complete an environmental analysis and prepare an EIS. They also provided information about the proposed lease tracts and solicited public comment to identify specific issues that should be addressed during the analysis and documented in the EIS.

In addition to the newsletter, the Forest Service and the BLM conducted three informational meetings to inform the public of the project and to solicit comments. The meetings were held in; 1) Pocatello, Idaho, on October 18, 1994; 2) Soda Springs, Idaho; on October 19, 1994; and 3) Afton, Wyoming, on October 20, 1994.

A Notice of Intent (NOI) to prepare an EIS, initiating the formal 30-day scoping period, was published in the Federal Register on November 11, 1994. In addition to the three informational meetings conducted in October 1994, a public scoping meeting was held in Pocatello, Idaho, on

November 21, 1994. The purpose of this meeting was to provide an opportunity for all parties to voice their opinions and concerns.

Comments were received from 23 attendees of the meetings held in October. There were no attendees at the formal scoping meeting held in November. In addition, written comments were received from 28 parties responding to the newsletter, legal notices, NOI, and news releases. The written comments are a part of the planning record located in the Forest Supervisor's office.

Issues

The Forest Service and the BLM reviewed, analyzed, and summarized the scoping comments. From this information, seven issues were identified and addressed in this EIS. Scoping respondents (the 28 parties who provided written comment and the 23 parties who attended one of the four public meetings) were notified by a second newsletter in April, 1995 of the results of the scoping process and were given a description of the seven issues. Some comments, although important in developing this EIS, were not formulated into formal issues. These comments and rationale for not including them as EIS issues are documented in Appendix C of this EIS. The decision to lease or not to lease has **not** been made. Responses below have been written as if the leasing has occurred and the leases have gone to development. The seven issues are:

Issue 1 The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on the roadless area characteristics and wilderness features

Roadless Areas outside of the proposed lease tracts and the potential transportation development areas will not be analyzed. The potential effects on Roadless Areas will be assessed by estimating the acres impacted for the following roadless area characteristics and wilderness features:

- Natural Integrity - acres affected.
- Apparent naturalness - acres affected.
- Remoteness - acres affected.
- Solitude - acres affected.
- Special features - features affected.
- Manageability/Boundaries.
- "Special Places - Special Values" - places affected.

Summary of Public Comment for Issue 1 - One concerned citizen recommended that roadless management areas should not be considered for lease. This commenter believes that there are sufficient areas of public land that are not designated roadless to accommodate this type of proposed action. Another commenter wanted to know how the potential impacts and protection of the natural integrity would be accomplished in Sage Creek and Meade Peak inventoried

roadless areas. Another commenter wanted to know how the integrity of the Dry Ridge and Huckleberry Basin roadless areas, located on either side of Slug Creek, would be protected.

Issue 2 The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on backcountry recreation and hunting opportunities and experiences

The potential effects on hunting and backcountry recreation and hunting opportunities will be assessed by estimating the acres impacted for the following:

- Acres changed for each Recreation Opportunity Spectrum Class.
- Miles of trail affected.
- Effects on hunter access.
- Potential changes to areas where people can hunt for elk, deer, moose, bear, cougar, grouse, etc.

Summary of Public Comment for Issue 2 - Concerns were expressed that there could be impacts on recreation and hunting opportunities if leasing and subsequent mining occurs. The commenters were concerned that proposals of this type generally result in areas being closed to recreation users and hunters seeking pristine countryside and solitude. There was additional concern expressed about losing the opportunity for a backcountry (primitive) type of experience in an area of high quality trophy elk hunting. Hunting is considered by many in southeast Idaho and southwest Wyoming as an important social and economic value.

Issue 3 The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on wildlife and wildlife habitats including old growth vegetation

The potential effects on wildlife and wildlife habitats, including old growth, will be assessed by estimating the impacts on the following:

- Acres of old growth disturbed.
- Acres of habitat affected for Management Indicator Species (MIS).
- Change in deer and elk habitat effectiveness.
- Changes in snag and log habitat numbers per acre.
- Acres of big game calving and fawning habitat affected.
- Acres of big game critical winter range affected.
- Acres of habitat affected for each threatened, endangered, and sensitive species.
- Big game migration routes and travel corridors.

Summary of Public Comment for Issue 3 - Concern was expressed about the potential effects of this proposal on wildlife habitat including migration corridors. Some commenters felt that

phosphate mines in southeast Idaho have dramatically altered deer/elk migration and that the region is already fragmented by mine locations. One commenter felt this area was an important corridor between Greater Yellowstone and the ranges in southern Idaho, northern Utah, and Nevada. Concern was expressed that the biodiversity of the region had not been comprehensively examined and questioned how much additional disturbance and fragmentation could be allowed given the recognition and importance of natural corridors that link relatively natural ecosystems. Mining and associated reclamation is changing forest habitats, for the near future, to grassland habitat or forb habitat types thus changing the wildlife that might be present. This change in habitat type could reduce hiding and reproductive cover for some species. Concern was also expressed about wildlife habitat degradation or loss. The effect of human activities on wildlife was also mentioned as a concern as well as habitat effectiveness and old growth allocations (how much, where is it located, and how much would be affected?).

Issue 4 The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on wetlands, riparian areas, water quality and fisheries in the Salt and Blackfoot River drainages

The potential effects on wetlands, riparian areas, water quality, and fisheries in the Salt and Blackfoot River drainages will be assessed by estimating the acres impacted for the following:

- Acres of disturbance by erosion class.
- Miles of stream affected by stream class.
- Miles of stream with cutthroat trout affected.
- Approximate acres of wetlands affected.
- Approximate tons of sediment/year added to streams.

Summary of Public Comment for Issue 4 - Commenters wanted adequate planning to be completed to protect water quality and fish populations, especially native cutthroat trout in Dry Creek, Slug Creek, and/or tributaries to the Salt River. This commenter felt that these fisheries are already impacted by "over grazing" and "destruction of riparian areas" and further impacts could be "totally destructive" to the fisheries. Concern was also expressed about loss of, or disturbance to, wetlands and riparian areas.

Issue 5 The effects of proposed phosphate leasing and subsequent exploration, mining and development on range livestock manageability

The potential effects on range livestock and livestock manageability within the Study area will be assessed by estimating the Animal Unit Months or acres impacted for the following:

- Animal Unit Months affected or removed for each allotment.
- Suitable acres of rangeland removed from production.

- Manageability of allotments - acres affected.

Summary of Public Comment for Issue 5 - The commenter is concerned that specific proposals could cause problems on individual livestock allotments. Roads, trucks and pedestrians could interfere with livestock management. There is also a concern about the loss of Animal Unit Months (AUMs) and range capacity reductions.

Issue 6 The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on the social and economic elements of southeast Idaho and southwest Wyoming

The potential effects on the social and economic elements of southeast Idaho and southwest Wyoming will be assessed by estimating the impacts for the following:

- Changes in the number of jobs by employment category.
- Changes in income generated to the Counties.

Summary of Public Comments for Issue 6 - Socioeconomics was not mentioned in the list of resource studies to be completed but should be. One commenter said that phosphate mining in southeast Idaho is a significant component of the economic base. Another commenter wanted economics and net public benefits to be addressed. This commenter also felt that economic analysis could be useful in decision making if the economic evaluation was comprehensive and documented all costs and benefits related to the proposed action.

Issue 7 The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on the Treaty Rights of the Shoshone-Bannock Tribes

The potential effects on the Treaty Rights of the Shoshone-Bannock Tribes will be assessed by estimating the impacts for the following:

- Treaty Rights for off-reservation hunting, fishing, and gathering.
- Religious Freedom (accessibility to sites, preservation of sites, noninterference with religious practices).

Summary of Public Comments for Issue 7 - Concern was expressed that the application of any land management action could have the potential for impermissible interference with the exercise of the Shoshone-Bannock Tribal treaty rights. Tribal members have the legal rights to hunt, fish, gather and otherwise use the unoccupied lands of the United States. As such, the Tribes are very concerned about potential impacts to resident fish habitat, wildlife, other natural resources, and cultural resources from various land uses such as grazing, logging, road building and mining.

The tribal staff recognized tribal activities on lands within the project analysis area that may be impaired by proposed project activities. Due to the potential impairment of treaty rights, the Tribes request that the USFS and BLM continue consultation and coordination with tribal representatives throughout the planning and decision-making process.

DEVELOPMENT OF ALTERNATIVES

The alternatives were developed in response to the issues and to ensure that a full range of leasing alternatives were addressed for each issue. The response of each alternative to the issues is documented with the description of each alternative. These specific resource issues were identified through the scoping process. Alternatives were also developed in response to the requirements of NEPA to analyze a full range of alternatives.

ALTERNATIVES CONSIDERED BUT NOT EVALUATED IN DETAIL

The reason for conducting this analysis is to make recommendation(s) and decision(s) in response to the purpose and need identified in Chapter 1. The BLM, by accepting the applications for leases, is required by regulations to conduct an environmental analysis and respond to the applicants. The effects to the surface resources would be the same for No Action as they would be for No Lease; therefore, they will be treated as one alternative, No Action/No Lease, in this EIS.

The following ore transportation options were considered but are not evaluated in detail. However, any lessee or mine developer could propose these or any other method of ore transportation.

A railroad line to the Manning Creek Tract or even to Star Valley to the east was not considered because it does not appear to be economically feasible. There does not appear to be enough ore reserves on the proposed lease tract to justify the expense of constructing a railroad line.

Hauling ore from the Manning Creek Tract by truck 40 miles to a rail head at Cokeville, Wyoming, was considered; however, it could not be accomplished without construction or upgrading of existing roads. The cost of trucking ore to Cokeville, along with the necessary ore handling/processing facilities, may outweigh the value of the ore deposits in the proposed lease tract.

To transport phosphate from the Dairy Syncline Tract, a haulroad or railroad was considered in Slug Creek, but shorter routes that were much less damaging to the environment are considered in the potential development scenarios.

Remoteness, costs, topographic and geographic difficulties, and severe wintertime conditions may preclude the building and use of ore haul roads or conveyor belt systems to get the ore from the Manning Creek lease tract to existing railroad or phosphate processing plant facilities.

ALTERNATIVES CONSIDERED IN DETAIL

Five alternatives were examined:

- Alternative 1 - No Action / No Lease
- Alternative 2 - Lease Both The Manning Creek and Dairy Syncline Tracts (Proposed Action)
- Alternative 3 - Lease The Dairy Syncline Tract & Do Not Lease the Manning Creek Tract.
- Alternative 4 - Lease The Manning Creek Tract & Do Not Lease the Dairy Syncline Tract
- Alternative 5 - Lease Portions of The Dairy Syncline Tract and Lease Portions of the Manning Creek Tract.

Based on the analysis contained in this EIS, these alternatives may be implemented in whole or used in part to develop another alternative. For example, an alternative could be selected that proposes leasing all of the Dairy Syncline Tract (as discussed in Alternative 3) and to lease the northern 1,200 acres of the Manning Creek Tract (as discussed in Alternative 5). The analysis contained in this document would adequately discuss the impacts of such a new alternative.

Mitigation Measures Common to all Action Alternatives

Under any of the alternatives, the standards and guidelines of the Caribou National Forest-Land and Resource Management Plan must be met. These are summarized in Appendix F of this EIS and contained in Chapter 3 of the Forest Plan (USDA 1985).

The following conditions of approval will be considered at the mine plan development stage.

The lessee shall exercise reasonable diligence, skill, and care in the operation of the property and carry out all operations in accordance with approved methods and practices as provided in the operating regulations, having due regard for the prevention of injury to life, health or property, and of waste or damage to any water or mineral deposits.

The lessee shall not conduct exploration or operations, other than casual use, prior to receipt of necessary permits or approval of plans of operations by the lessor.

The lessee shall carry on all operations in accordance with approved methods and practices as provided in the operating regulations and the approved mining plans in a manner that minimizes adverse impacts to the land, air, water, cultural, biological, visual, minerals and other resources, and to other land uses or users. Lessee shall take reasonable measures deemed necessary by the lessor to accomplish the intent of the lease term. Such measures may include, but are not limited to, modification to proposed site or design of facilities, timing of operations, and specification of interim and final reclamation procedures.

The lessee is subject to the Federal Water Pollution Control Act (33 U.S.C. 1151-1175), the Clean Air Act (42 U.S.C. 1857 et. seq.), and to all other applicable laws pertaining to exploration activities, mining operations, waste disposal, and reclamation.

The following stipulation for Lands of the National Forest System under jurisdiction of the Department of Agriculture will be attached to and made a part of the lease if one is issued (see Appendix G for sample Lease and Stipulations).

"The licensee/permittee/lessee must comply with all the rules and regulations of the Secretary of Agriculture set forth at Title 36, Chapter II, of the Code of Federal Regulations governing the use and management of the National Forest System (NFS) when not inconsistent with the rights granted by the Secretary of the Interior in the license/prospecting permit/lease. The Secretary of Agriculture's rules and regulations must be complied with for; 1) all use and occupancy of the NFS prior to approval of a permit/operation plan by the Secretary of the Interior; 2) uses of all existing improvements such as Forest development roads within and outside the area licensed, permitted or leased by the Secretary of the Interior; and 3) use and occupancy of the NFS not authorized by a permit/operating plan approved by the Secretary of the Interior.

Widths of Disturbance, Assumed, Common to all Action Alternatives

Clearing and widths of disturbance are the same for all alternatives and potential development scenarios for the following possible mining infrastructure elements:

- haul roads are about 150 feet wide
- railroads are about 100 feet wide
- power lines are about 20 feet wide
- slurry lines are about 50 feet wide
- tailings lines are about 50 feet wide
- conveyor systems are about 50 feet wide
- access roads are about 50 feet wide

Mitigation Measures

The following mitigation measures are ones that will be applied at the mine proposal stage and will not become lease stipulations. This becomes necessary because at this stage there are only conceptual mine plans that may not represent actual development in every detail if/when it is proposed. All of the site-specific determinations cannot be made at this conceptual stage. These measures which apply to all action alternatives demonstrate that anticipated impacts can be mitigated or minimized to an acceptable level.

Roadless Resources

- 1) Locate mining and related operations and facilities outside of the remaining undeveloped and undisturbed portions of the existing roadless areas where feasible.

Shoshone-Bannock Treaty Rights

- 2) Native Americans of the Shoshone-Bannock tribes will be allowed access, within mine safety requirements/standards, according to tribal treaty rights during the life of the mine(s). Traditional access will resume upon cessation of mining reclamation activities.

Recreation Resources

- 3) Relocate those sections of the groomed snowmobile trail in the Dairy Syncline area that are affected by mining activities.
- 4) Relocate and/or replace the system trails in the Manning Creek area that are affected by mining activities.

Wildlife Resources

- 5) Restrict mine development within 300 slope feet of Deer Creek, North Fork of Deer Creek, or the South Fork of Sage Creek if practicable. Structures, facilities, and roads will also be located outside this zone unless unavoidable.
- 6) Survey likely goshawk nesting areas and take measures necessary to mitigate adverse impacts prior to surface disturbing activities.
- 7) Obtain and conform with the requirements of appropriate permits for any disturbance to wetlands and mitigate as necessary to prevent unacceptable impacts to wildlife.

- 8) Backfill pits to the amount practicable to minimize the size of barriers to big game and other wildlife migration/travel.
- 9) Control public access into areas developed for exploration or mining activities to avoid or minimize disturbance to wildlife.
- 10) Analyze and mitigate impacts to vegetation and key wildlife habitats during mine planning (such as big game cover and forage ratios, travel corridors, elk calving and deer fawning areas, nesting areas, and unique and /or special habitats).
- 11) Off-site vegetation/habitat enhancement should be considered as a mitigative measure for on-site impacts.
- 12) Practice concurrent reclamation where feasible.
- 13) Design, implement, and enforce a travel management policy to comply with the Caribou National Forest Travel Management Plan.

Vegetation Resources

- 14) If Threatened, Endangered, or Sensitive plant species are found in areas to be disturbed by exploration/mining activities, the plants and their habitats will be protected until a decision on the significance of the impact to the population is made by Caribou National Forest staff through consultation with appropriate agencies.

Reclamation

- 15) Implement an overall reclamation program designed to reclaim project features (pits, waste dumps, tailings disposal areas, haul roads, mill sites, conveyor systems, railroads, slurry pipeline and transmission line corridors, etc.) in accordance with standards required by the Idaho Surface Mining Act and the Forest Service as established prior to the approval of the mine plan.
- 16) Work towards restoring diverse plant communities that incorporate native species beneficial to wildlife including grasses, forbs, brush, aspen, and conifer. A reclamation plan, which accompanies the mining plan, would incorporate a long-term revegetation plan. Seeding should generally be done in the Fall or early Spring to utilize soil moisture accumulated during the winter.
- 17) Shape waste dumps and back-filled pits to blend with the surrounding topography where practicable.

- 18) Plan, locate, design, and construct waste dumps using applicable engineering technology and methods that would ensure their long-term stability. Reclaimed waste dump slopes would generally not exceed 3:1.
- 19) Strip and salvage topsoil from the surface of lands to be disturbed. Use topsoil as the surface material prior to seeding. Minimize the use of topsoil stockpiles by directly placing topsoil whenever possible.
- 20) Prohibit livestock grazing on reclaimed areas until the area is released to multiple-use management.

Soil, Fisheries and Watershed Resources

- 21) Install sediment dams or excavated sediment ponds to control sediment from entering streams and drainageways leaving disturbed areas.
- 22) Ensure that water and sediment control structures comply with State of Idaho dam safety regulations where applicable. Ensure that these structures are serviced and maintained during the period of mining, or such period thereafter, as required by the Forest Service prior to relinquishment of the reclamation bonds.
- 23) Construct roads, pipelines, or other stream crossings during periods when sediment production can be minimized/mitigated.
- 24) Mining related disturbances (excluding a possible haul road crossing the South Fork of Sage Creek - see #5 above and #27 below) will not be allowed within 300 slope feet of perennial streams if practicable. Where no alternative exists, locate and construct to avoid or mitigate impacts to inland native fish.
- 25) Any disturbance to wetlands that could occur related to the potential leasing of these tracts would require the appropriate Federal and State permits. Any conditions or mitigations required in those permits would have to be met.
- 26) If wetlands, permanently flowing non-fish-bearing streams, or seasonally flowing or intermittent streams are to be disturbed, all practicable measures to maintain, protect, or mitigate adverse impacts to downstream fisheries will be required.
- 27) If the proposed lease tracts are offered for competitive lease sale, it is possible that the Manning Creek Tract could be mined in connection with the existing Smoky Canyon Mine. Such development would require a haul road to be constructed across the South Fork of Sage Creek. Based on the location of the phosphate ore and topography, the

location for such a crossing could be across that portion of the creek that may be intermittent. Safeguards would be required to protect any downstream fisheries.

Existing Transportation Resources (roads)

- 28) Safe public access will be maintained along the Slug Creek road corridor.
- 29) General motorized access will be prohibited through mine properties during the development process. Other access to potential mine areas, or access cut off by mining, will be evaluated on a site-specific basis at the mine plan approval stage and appropriate mitigation required.

Air Resources

- 30) Applicable State and Federal air quality permits will be obtained prior to surface disturbance; appropriate air quality standards must be met.

Cultural Resources

- 31) Before approval of a mining plan, the authorized officer will require a survey of areas to be disturbed to provide an inventory of any historical, cultural, and archaeological values. The survey shall be done by a qualified professional archaeologist, approved by the authorized officer, and a report of the survey shall be submitted to the authorized officer. The approval of an exploration or mining plan will be conditioned on the approval of the survey report and the approval of measures to protect any historical, cultural, or archaeological values that may be present.
- 32) If any items or features of historical, cultural, or archaeological value are discovered during operations, the lessee shall immediately notify the authorized officer and shall not disturb such items or features until the authorized officer issues instructions. If the lessee is ordered to take measures to protect any items or features of historical, cultural, or archaeological value discovered during the operations, the cost of the measures shall be borne by the lessee and such items and features shall remain under the jurisdiction of the United States.

Paleontological Resources

- 33) If fossil vertebrate remains are found during exploration or mining related activities, the lessee/operator will protect the fossils and contact the Forest Service as soon as

practicable. The Forest Service, in consultation with the Idaho Museum of Natural History, shall determine what measures will be taken to ensure the preservation of important fossils. Any costs associated with the recovery and/or preservation of such fossils will be borne by the lessee/operator.

Visual Resources

- 34) Ensure that clearing for utility corridors and roads is done in accordance with the Forest Service Scenery Management Handbook.

Range and Livestock Resources

- 35) A noxious weed control plan must be approved before mining operations begin.
- 36) Assess the opportunities for using settling ponds and basins for livestock watering once mining activities have ceased.
- 37) Replace or relocate impacted livestock water developments.
- 38) Where other means are not effective, fencing of mining/transportation related facilities may be necessary to avoid conflicts with livestock grazing.

DESCRIPTION OF THE ALTERNATIVES

Alternative 1 - No Action/No Lease

The No Action alternative is required by CEQ (40 CFR Part 1508.25) and is intended to reflect a situation where neither of the proposed lease tracts would be leased at this time. Forest Service direction for implementing the requirements of NEPA identifies two options for defining the No Action Alternative: 1) no change from current management direction or from the level of intensity, and 2) no action or activity would take place.

The No Action/No Lease alternative is needed to define one end of the possible range of alternatives and reflects the effects of not leasing either proposed lease tract. Under this alternative the two proposed lease tracts would not be leased at this time. Existing leases within the area would remain in effect until they are relinquished.

This alternative is responsive to Issues 1, 2, 3, 4, 5, and 7 which reflect comments related to protecting resource values. It protects, from mining activities, the existing condition of all natural resource values within these proposed lease tracts at this time.

Under this alternative, no mining and development activity would take place on these proposed lease tracts at this time. However, existing leases could be mined to supply southeast Idaho phosphate plants. It is assumed that ore would be available from some source to supply the phosphate plants.

Impacts from mining would not occur in the proposed lease tracts now, but impacts from mining would probably occur in other areas of the Caribou National Forest to compensate for no mining here. The impacts cannot be quantified now, because it is not known where they would be--but there would be other impacts.

Alternative 2 - Lease Both The Manning Creek and Dairy Syncline Tracts (Proposed Action)

Introduction

This alternative is the proposed action (Figures 2-1 and 2-2). Under this alternative, the entire 1,920 acres of the Manning Creek Tract and the entire 3,259 acres of the Dairy Syncline Tract would be offered for competitive leasing. See Appendix A for a legal description.

This alternative would be responsive to Issue 6 and reflects comments related to socioeconomic conditions in southeast Idaho and western Wyoming. Some rationale for development of this alternative is listed below. This alternative:

- represents the proposals requested in the lease applications.
- would be responsive to current demands for phosphate.
- would help stabilize existing mining related jobs in the local communities.
- utilize all of the phosphate present within the proposed lease tracts.

The following potential mining and ore transportation development scenarios have been developed from conceptual mine plans and potential mitigation measures for each of the proposed tracts. These development scenarios represent the first cut, preliminary conceptual mining and development activities that could occur if the entire proposed lease tracts were to be offered for sale (see Figures 2-5 and 2-6 at the end of this Chapter).

Manning Creek Tract

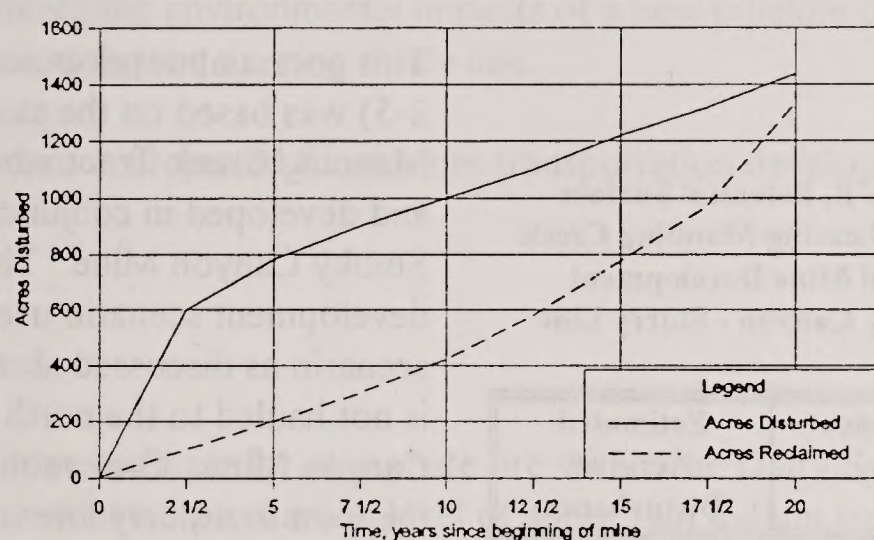
There are two development scenarios for ore transportation and mine development for the Manning Creek Tract identified in the conceptual mine plan that will be evaluated in this EIS. The mining of this tract could be developed in conjunction with the existing Smoky Canyon Mine (operated by J.R. Simplot Company) or it could be mined and developed as a separate mine operation and not in conjunction with the Smoky Canyon Mine. Because of the two possible mine

development scenarios, two ore transportation development scenarios are evaluated (see Figure 2-5 at the end of this Chapter).

Preliminary conservative estimates of potential phosphate ore for the Manning Creek Tract are between 20 and 50 million tons with about 30 million tons being the most probable. Using an estimated production level of two million tons per year, the life expectancy of this tract would be about 15 years.

For this analysis, it is assumed that the external waste disposal areas, pits, and siltation ponds would be the same for either ore transportation alternative. It is also estimated that about 85 percent of the disturbed areas would be reclaimed (see graphic depiction below).

Typical - Comparison of Mining Land Disturbance VS Reclamation



The graph above is a hypothetical display of land disturbance and reclamation acres over time. Acres disturbed indicates the number of acres of land disturbance from the beginning of the mine development. Acres reclaimed indicates the number of acres of land reclaimed. The difference between the two represents the acres which are not reclaimed. It is estimated that about 15 percent of the pit will not be reclaimed.

Potential Development Scenario A - Mine Development as a Continuation of Smoky Canyon Mine

This conceptual mine development scenario is based on the proposed Manning Creek Tract being leased and developed in conjunction with the Smoky Canyon Mine. Under this development scenario, the tract would be mined as a southern extension of the Smoky Canyon Mine and possibly in conjunction with other leases held by J.R. Simplot Company south of the Manning Creek proposed lease tract.

Table 2 -1 Scenario A, Potential Surface Disturbance Area for Leasing Manning Creek Tract with Potential Development as a Continuation of Smoky Canyon Mine

| Description of Disturbance | Estimated Acres of Disturbance |
|--------------------------------|--------------------------------|
| Pits | 640 |
| External Waste Disposal Areas | 140 |
| Haul roads (about 2.1 miles) | 39 |
| Silt Retention Ponds (15) | 30 |
| TOTAL ACRES DISTURBANCE | 849 |

Table 2-2 Scenario B, Potential Surface Disturbance Area for Leasing Manning Creek Tract with Potential Mine Development Separate From Smoky Canyon - Slurry Line

| Description of Disturbance | Estimated Acres of Disturbance |
|----------------------------------|--------------------------------|
| Pits | 591 |
| External Waste Dumps | 140 |
| Haul roads (about 2.1 miles) | 39 |
| Wash plants/Stockpile | 25 |
| Slurry Line (about 24.8 miles) | 150 |
| Tailings Line (about 10.7 miles) | 65 |
| Tailings Pond (existing pit) | 0 |
| Office/Shop Complex | 18 |
| Staging Area | 5 |
| Fuel/Lube Oil Storage | 1 |
| Silt Retention Ponds (15) | 30 |
| Power lines (about 4.8 miles) | included with tailings line |
| Access Road | 35 |
| TOTAL DISTURBANCE | 1,099 |

Under this potential development scenario (Figure 2-5), the ore would be hauled north across the South Fork of Sage Creek on roads that will tie to the existing Smoky Canyon Mine road system where the ore will be hauled to the stockpile at Smoky Canyon. The total estimated disturbance for this development scenario is shown in Table 2-1.

Potential Development Scenario B - Mine Development Separate From Smoky Canyon Mine with a Slurry Line

This potential development scenario (Figure 2-5) was based on the assumption that the Manning Creek Tract would not be leased and developed in conjunction with the Smoky Canyon Mine. This potential development scenario uses the same mining scenario as discussed above except the ore is not hauled to the north into the Smoky Canyon Mine. Ore would be transported to the west in a slurry line with the mine shops and ore milling/processing facilities included in the lease tract area.

The potential mine access road from the east was located to avoid crossing private land and difficult terrain. Other access routes may be possible. The access road would be used by mine employees and vendors supplying services/materials to the mine.

The potential mine shop/office/ore processing (milling) facility location was selected because of its central location on the deposit, because of the very difficult topographic constraints, and so that the slurry line did not cross the pit. Site of the mine facilities were shown on the map

would preclude mining in the immediate area, and some of the potentially recoverable ore would be lost. Other sites for the shop/mill facilities may be available.

The conceptual tailings line analyzed would be located in the Development Scenario B access road (buried) to the point where the conceptual power line crosses the access road, then the power line and the tailings line would be located in the same area of disturbance as the existing power line. Only the tailings line would continue to the existing tailings pond located in the Roberts Creek drainage (SW 1/4 Section 21 and SE 1/4 Section 20, Township 8 South, Range 46 East).

The conceptual slurry line was located to minimize pumping requirements. Better locations for a slurry line may exist. Once the slurry line reaches Diamond Creek, it could be buried in the Diamond Creek road until it joins the existing slurry line corridor which extends from the Smoky Canyon mine to Conda, Idaho. From that point, it could utilize the same corridor as the existing slurry line which minimizes the environmental impacts of a new pipeline corridor. This would still involve new disturbance along the existing slurry line.

The total area of disturbance projected for this ore transportation development scenario is shown in Table 2-2.

Dairy Syncline Tract

A preliminary conservative estimate for phosphate ore within the Dairy Syncline Tract is about 20 million tons. Using an estimated production level of about two million tons per year the life expectancy of this tract would be about ten years. It is estimated that about 85 percent of the disturbed areas would be reclaimable.

The following conceptual mining and transportation plan has been developed for the Dairy Syncline proposed lease tract and is briefly described below. Several ore transportation scenarios are possible under this conceptual development scenario. The features which are common to all potential ore transportation development scenarios are pits and waste rock storage locations (see Figure 2-6).

Pits - Under this conceptual plan, four prospective mining areas are identified and described as pits #1 through #4. Pending additional exploration drilling and geological interpretation, a fifth potential mining area may exist in Green Basin. For purposes of identifying total potential pit surface disturbance, this area is included in the surface disturbance summary. The conceptual mine plan shows the south end of the tract being mined first, then mined northward. The assumption for this analysis, based on the conceptual mine plan, is that approximately 70 percent of the mined-out pits will be backfilled and reclaimed. If 70 percent of the pits are backfilled and

reclaimed and 100 percent of all other disturbances are reclaimed, then 85 percent of the total disturbed area could be reclaimed.

Waste Rock Dump Areas - As many as ten waste rock storage areas are identified for use under this conceptual plan. The potential surface disturbance of the ten waste areas is estimated to be about 300 acres.

Other Support Facilities - A new shop/office complex could be constructed in Green Basin at a location near the upper end of Wilde Canyon. The fuel storage facilities and equipment staging areas could also be located at this site. The ore loading tipple/stockpile site locations and power line locations would be dependent on which transportation alternative was implemented. The conceptual mine plan discusses the use of electric shovels. If electric shovels are used, the conceptual mine plan calls for a 43,000 volt transmission line to be constructed parallel to the specific transportation alternative routes to the office/shop located in Green Basin. From this point, 4,160 volt feeder lines would be run to the various pits and extended along the entire length of the pits. For the purpose of determining the approximate surface disturbance of the entire Dairy Syncline Tract, the conceptual mine plan indicates that 15 siltation basins would probably be needed. The surface disturbance resulting from the construction of facilities will vary depending on which ore transportation development scenario is used. The specific detail for each facility is available in the Tables associated with the description of the ore transportation development scenarios (see Figure 2-6).

Potential Development Scenario A - Truck Haulage

Under this potential development scenario (Figure 2-6), the mined ore would be hauled by truck directly from the Dairy Syncline mine property to the existing Mountain Fuel Mine tipple.

Approximately 19 miles of new haul roads would be constructed under this potential development scenario. The

Table 2-3 Potential Surface Disturbance for Leasing Dairy Syncline Tract with Potential Development Scenario A - Truck Haulage

| Description of Area of Disturbance | Estimated Acres of Disturbance |
|------------------------------------|--------------------------------|
| Pits | 650 |
| External Waste Dumps | 300 |
| Haul roads (about 19 miles) | 345 |
| Tipple/Stockpile (existing) | 0 |
| Office/Shop Complex | 18 |
| Staging Area | 5 |
| Fuel/lube oil storage | 1 |
| Power lines (about 10.3 miles) | 25 |
| Silt Retention Ponds (15) | 30 |
| TOTAL DISTURBANCE | 1,374 |

potential surface disturbance resulting from the construction of the new haul roads would total about 345 acres (see Table 2-3).

Table 2-4 Potential Surface Disturbance for Leasing Dairy Syncline Tract with Potential Development Scenario B - Railroad-Truck Haulage

| Description of Area of Disturbance | Estimated Acres of Disturbance |
|------------------------------------|--------------------------------|
| Pits | 650 |
| External Waste Dumps | 300 |
| Haul roads (about 14.9 miles) | 270 |
| Railroad (about 7.4 miles) | 90 |
| Tipple/Stockpile | 15 |
| Office/Shop Complex | 18 |
| Staging Area | 5 |
| Fuel/lube oil storage | 1 |
| Power lines (about 14.4 miles) | 35 |
| Silt Retention Ponds (15) | 30 |
| TOTAL DISTURBANCE | 1,414 |

Potential Development Scenario B - Railroad/Truck Haulage

Under this potential development scenario (Figure 2-6), a 7.4 mile railroad spur, resulting in about 90 acres of disturbance, would be constructed from the existing Dry Valley (Maybe Canyon) rail line through Dry Canyon to an ore loading tipple site to be located in Wilde Flats. The ore mined from the Dairy Syncline property would be hauled to a tipple site at Wilde Flats and stockpiled. The potential surface disturbance resulting from the approximately 14.9 miles of supplementary haul roads would be about 270 acres (refer to Table 2-4).

Potential Development Scenario C - Conveyor/Railroad/Truck Haulage

Under this potential development scenario (Figure 2-6), the mined ore would be hauled by truck to an ore stockpile site located just north of Green Basin. A conveyor, approximately 1.7 miles long, would be used to transport the stockpiled ore from this site to a railroad ore loading tipple located on private land. The loaded ore would then be transported by rail to the existing Dry Valley (Maybe Canyon) rail line. This potential development scenario involves the construction of a new 5.1 mile railroad spur from the existing Dry Valley railroad through Dry Canyon to the private land railroad loading tipple. The potential surface disturbance resulting from the construction of the conveyor system, railroad, and supplementary haul roads is shown in detail in Table 2-5.

**Table 2-5 Potential Surface Disturbance
for Leasing Dairy Syncline Tract With Potential
Development Scenario C - Conveyor-Railroad-
Truck Haulage**

| Description of Area of Disturbance | Estimated Acres of Disturbance |
|------------------------------------|--------------------------------|
| Pits | 650 |
| Waste Dumps | 300 |
| Haul roads (about 12.4 miles) | 225 |
| Railroad (about 5.1 miles) | 62 |
| Conveyor (about 1.7 miles) | 6 |
| Tipple/Stockpile | 20 |
| Office/Shop Complex | 18 |
| Staging Area | 5 |
| Fuel/lube oil storage | 1 |
| Power lines (about 16.5 miles) | 40 |
| Silt Retention Ponds (15) | 30 |
| TOTAL DISTURBANCE | 1,357 |

Potential Development Scenario D - Slurry Line

The use of a slurry line ore transportation system is contingent on several factors, including the presence of sufficient Dairy Syncline ore reserves to justify the costs to construct an ore beneficiation plant, slurry line, tailings line, and tailings pond.

Under this potential development scenario (Figure 2-6), an ore beneficiation plant (wash plant) would be constructed in Wilde Flats (same location as the ore loading tipple site proposed under Development Scenario B - "Railroad Haulage"). The mined ore would be hauled by truck to an ore stockpile site located at the wash plant, and the wash plant product (ore concentrate) would be transported approximately 15.7 miles to Conda, Idaho, via a slurry line. The slurry line alignment is described as follows: Beginning at the mill site in Wilde Flats, the slurry line would extend in a northerly direction about 4 miles to the Simplot slurry line right-of-way located on the Wallentine Ranch property; thence about 11.7 miles along the Simplot right-of-way to Conda, Idaho.

Several potential areas exist for disposal of the wash plant waste (tailings). One development scenario is to pipe the wash plant tailings to a tailings pond located in the Canyon Dump drainage near the Mountain Fuel South Pit. The tailings line alignment is as follows: Beginning at the mill site, the tailings line would extend about one half mile in a northeast direction; thence about one

mile in an easterly direction to tailings pond #1 located in the Canyon Dump drainage. A lateral tailings line could be extended from this tailings line to the mined-out Mountain Fuel North Pit for additional storage (tailings pond #2). The mined-out Mountain Fuel East Limb Pit would serve as a preferred alternate to Pond #1 for storage of tailings. The East Limb Pit has not been reclaimed, and therefore, does not contribute to the total acres disturbed. Refer to Table 2-6 for details.

Alternative 3 - Lease The Dairy Syncline Tract & Do Not Lease the Manning Creek Tract.

Table 2-6 Potential Surface Disturbance for Leasing Dairy Syncline Tract with Potential Development Scenario D - Slurry Line

| Description of Area of Disturbance | Estimated Acres of Disturbance |
|------------------------------------|--------------------------------|
| Pits | 650 |
| Waste Dumps | 300 |
| Haul roads (about 14.9 miles) | 270 |
| Wash Plant/stockpile | 25 |
| Slurry Line (about 15.7 miles) | 95 |
| Tailings Lines (about 2.6 miles) | 16 |
| Tailings Ponds (existing pit) | 0 |
| Office/Shop Complex | 18 |
| Staging Area | 5 |
| Fuel/lube oil storage | 1 |
| Power lines (about 10.3 miles) | 25 |
| Silt Retention Ponds (15) | 30 |
| TOTAL DISTURBANCE | 1,435 |

Introduction

Under this alternative, the entire 3,259 acres within the proposed Dairy Syncline Tract would be offered for competitive leasing. The Manning Creek Tract would not be offered for competitive leasing at this time.

This alternative would respond in part or in whole to Issues 1, 2, 3, 4, 5, and 7 and reflects the comments received during scoping. Some rationale for development of this Alternative are listed below. This Alternative:

- does not impact about 4.5 miles of habitat for the fine spotted cutthroat in the Deer Creek System.
- avoids disturbing about 850 to 950 acres of Hairy Woodpecker snag and log habitat in the Manning Creek area.
- avoids disturbing by potential mine development about 1,800 acres of thermal and security cover in the Manning Creek area.
- avoids disturbing between 850 and 950 acres of suitable raptor nesting habitat within the Manning Creek area.
- avoids creating additional fragmentation of wildlife habitat within the Manning Creek area.
- avoids leasing within the Sage Creek Roadless Area at this time.
- leaves the existing condition of the hunting and recreation opportunities in the Manning Creek study area as they are. Ten trails are not impacted.
- does not impact the existing condition of wetlands, riparian areas, and floodplains in the Manning Creek study area by phosphate mining.

- avoids further impacts to the Manning Creek, Deer Creek, Sage Creek, Pole Canyon, and Stewart Canyon Sheep Allotments. It also avoids impacts to the Sage Valley and Diamond Creek Cattle Allotments in the Manning Creek study area from potential phosphate mining activities at this time.
- does not affect tribal treaty rights for the Manning Creek Tract area.
- provides for leasing and future development of phosphate reserves in the Dairy Syncline Area.

The description of potential mining and development scenarios for this Alternative is the same as the description for the Dairy Syncline Tract under Alternative 2, beginning on page 2-17 of this Chapter.

Alternative 4 - Lease The Manning Creek Tract & Do Not Lease the Dairy Syncline Tract

Introduction

This alternative would lease the entire 1,920 acres of the proposed Manning Creek Tract and would not lease any of the proposed Dairy Syncline Tract.

This alternative responds in part or in whole to Issues 1, 2, 3, 4, 5, 6, and 7 and reflects the comments received through scoping. Some rationale for development of this Alternative are listed below. This alternative:

- avoids disturbing about 700-750 acres of Hairy Woodpecker snag and log habitat in the Dairy Syncline area.
- avoids direct impacts on about 1,000 acres and indirect impacts on additional acres of elk calving and deer fawning habitat within the Dairy Syncline area.
- does not impact the riparian, wetlands, and floodplains and maintains water quality within the Dairy Syncline Tract.
- avoids disturbance of about 700 to 800 acres of potential raptor nesting habitat within the Dairy Syncline area which includes an area known to have provided suitable nesting habitat for goshawks.
- avoids leasing and potential disturbance of a large cliff complex (special and unique wildlife habitat) in the northern portion of the Dairy Syncline area.
- avoids leasing within the Huckleberry Basin Roadless Area and avoids potential mining facilities in the Dry Valley Roadless Area.
- would leave the backcountry and hunting opportunities in the Dairy Syncline study area without additional impacts from potential phosphate leasing and mining at this time.
- would help preserve mining jobs and the socioeconomic conditions in the Star Valley, Wyoming area.
- avoids leasing 22 acres of old growth timber (Hairy Woodpecker habitat) within the northern portion of the Dairy Syncline area.

- would not lease a block of big game security habitat located in relatively rugged terrain where deer, elk, and other big game find security in the northern portion of the Dairy Syncline Tract.
- avoid further impacting the Dry Valley Cattle and Slug Creek Sheep Allotments from mining activities in the Dairy Syncline area.

The description of the potential development scenarios for this Alternative are the same as the description of proposed Manning Creek Tract under Alternative 2 (see Figure 2-5).

Alternative 5 - Lease Portions of The Dairy Syncline Tract and Lease Portions of the Manning Creek Tract.

Introduction

Under this alternative, approximately 2,142 acres within the southern portion of the Dairy Syncline Tract and approximately 1,120 acres within the northern portion of the Manning Creek Tract would be offered for competitive leasing (see Appendix A for legal descriptions) (see Figures 2-3 and 2-4).

This Alternative responds in part or in whole to Issues 1, 2, 3, 4, 5, 6, and 7 and reflects the scoping comments received. Some rationale for development of this Alternative are listed below. This Alternative:

Manning Creek Tract Area

- does not impact about 4.5 miles of habitat for the fine spotted cutthroat trout in the Deer Creek System.
- avoids disturbing about 400 acres less suitable raptor nesting habitat than Alternatives 2 and 4.
- avoids disturbing about 400 acres less snag and log (Hairy Woodpecker) habitat than Alternatives 2 and 4 in the Manning Creek area.
- impacts less elk calving and deer fawning areas than Alternatives 2 or 4.
- avoids leasing and potential mine development on about 150 acres less thermal and security cover than Alternatives 2 and 4 which impacted about 1,800 acres.
- avoids leasing within the unroaded southern portion of Sage Creek Roadless Area.
- leaves the backcountry recreation and hunting opportunities in the southern portion of Manning Creek Tract.
- would help preserve mining jobs and the socioeconomic conditions in the Star Valley, Wyoming area for a few more years than Alternative 3.
- avoids impacts to the Deer Creek Sheep Allotment.
- avoids leasing about 235 acres less Partial Retention Visual Quality Objective.
- avoids impacts to stream morphology and water quality in the Deer Creek system.

Dairy Syncline Tract Area

- avoid leasing and potential development in an area known to have provided suitable nesting habitat for goshawks.
- would avoid disturbing about 250 to 300 acres less suitable raptor nesting habitat than Alternatives 2 and 3.
- avoids disturbing about 300 acres less snag and log (Hairy Woodpecker) habitat than Alternatives 2 and 3 in the Dairy Syncline area.
- would avoid leasing a block of big game security habitat located in relatively rugged terrain where deer, elk, and other big game find security in the northern portion of the Dairy Syncline Tract.
- avoids leasing and disturbance of 22 acres of old growth timber within the northern portion of the Dairy Syncline area.
- would avoid leasing a large cliff complex (special and unique wildlife habitat) in the northern portion of the Dairy Syncline Tract.
- would avoid leasing most of the existing conifer (Ruffed Grouse) habitat in the northern portion of Dairy Syncline Tract.
- avoids leasing the northern portion of the Huckleberry Basin Roadless Area.
- leaves the backcountry recreation and hunting opportunity in the northern portion of the Dairy Syncline study area as it is.
- less impacts on grazing in units 3 and 4 of the Dry Valley Cattle Allotment.
- less potential for direct or indirect effects to water quality in Slug Creek.

The following potential mining and ore transportation scenarios have been developed from conceptual mine plans and potential mitigation measures for both of the proposed lease tracts. These development scenarios represent possible mining and development activities that could take place if the described portions of the proposed lease tracts were offered for sale.

Manning Creek Tract

Under this alternative, the BLM would lease only 1,120 acres in the northern portion of the proposed Manning Creek Tract. The potential impacts that would be reduced or avoided can be estimated by reviewing the list of items above that are responding to this Alternative. The potential mine development of this proposed tract could be in conjunction with the Smoky Canyon Mine (operated by J.R. Simplot Company), or it could be mined and developed as a separate mine. Because of two possible mine development scenarios, two ore transportation development scenarios are evaluated.

A preliminary conservative estimate of phosphate reserves on the 1,120 acres (about 62 percent of the tract) in the northern portion is between 12 and 30 million tons with about 20 million tons being the most probable. This estimate was determined by using 62 percent of the amounts estimated for Alternative 2. Life expectancy of a mine on this potential lease tract would be about 10 years assuming a production level of two million tons per year.

This Alternative could affect the sequence of development of leases south of Deer Creek.

Potential Development Scenario A - Mine Development as a Continuation of Smoky Canyon Mine

The description of this potential development scenario is essentially the same as Alternative 2, Development Scenario A. Table 2-7 reflects the acres of disturbance which would result from leasing only the northern 1,120 acres of the Manning Creek Tract.

Table 2-7 Scenario A. Potential Surface Disturbance Area for Leasing Manning Creek Tract with Potential Development as a Continuation of Smoky Canyon Mine.

| Description of Disturbance | Estimated Acres of Disturbance |
|--------------------------------|--------------------------------|
| Pits | 320 |
| External Waste Disposal Areas | 140 |
| Haul Roads (about 1.0 miles) | 18 |
| Silt Retention Ponds (7) | 14 |
| TOTAL ACRES DISTURBANCE | 492 |

Table 2-8 Scenario B. Potential Surface Disturbance Area for Leasing Manning Creek Tract with Potential Mine Development Separate From Smoky Canyon - Slurry Line

| Description of Disturbance | Estimated Acres of Disturbance |
|----------------------------------|--------------------------------|
| Pits | 271 |
| External Waste Dumps | 140 |
| Haul roads (about 1.0 miles) | 18 |
| Washplant/Stockpile | 25 |
| Slurry Line (about 24.8 miles) | 150 |
| Tailings Line (about 10.7 miles) | 65 |
| Tailings Pond (existing pit) | 0 |
| Office/Shop Complex | 18 |
| Staging Area | 5 |
| Fuel/Lube Oil Storage | 1 |
| Power lines (about 4.8 miles) | included with tailings line |
| Silt Retention Ponds (7) | 14 |
| Access Road (about 4.8 miles) | 35 |
| TOTAL DISTURBANCE | 742 |

Potential Development Scenario B - Mine Development Separate From Smoky Canyon Mine with a Slurry Line

The description of this potential development scenario is the same as Potential Development Scenario B, Alternative 2. Table 2-8 reflects the acres of disturbance which would result because of leasing only 1120 acres.

Dairy Syncline Tract

This Alternative would lease 2,142 acres in the southern portion of the Dairy Syncline Tract.

A preliminary conservative estimate of the potential phosphate reserves within the 2,142 acres (about 65 percent of Alternative 2) is about thirteen million

tons. Using an estimated production level of about two million tons per year, the expected life of a mine would be six to seven years. This estimate was determined by using about 65 percent of the amount in Alternative 2 of the Dairy Syncline Tract.

The following conceptual mining and transportation plan has been developed for the Dairy Syncline lease Tract and is briefly described below. The ore transportation alternatives possible under this conceptual development scenario are essentially the same as Alternative 2. Several activities will be the same regardless of the ore transportation development scenario. The activities which are common to all ore transportation development scenarios are pit and waste rock storage locations.

Pits - Under this conceptual plan, two prospective mining areas are identified and described as pits #1 and #2. Pending additional exploration drilling and geological interpretation, a third potential mining area may exist in Green Basin. For purposes of identifying total potential pit surface disturbance, this area is included in the estimated acres of disturbance (Tables 2-9, 2-10, 2-11, and 2-12). Based on a preliminary examination of the property, it appears it would be advantageous to mine the property from the south to the north in order to maximize the backfilling of mined-out pits. The assumption for this preliminary analysis is that approximately 70 percent of the mined-out pits will be backfilled and reclaimed. The total acres of surface disturbance for pits would be about 490 acres.

Waste Rock Dump Areas - Six waste storage areas are identified for use under this conceptual plan. The potential surface disturbance of the six waste areas is estimated to be 190 acres.

Other Support Facilities - A new shop/office complex could be constructed in Green Basin at a location near the west entrance to Wilde Canyon. The fuel storage facilities and equipment staging areas could also be located at this site. The ore loading tipple/stockpile site locations and power line locations would be dependent on which transportation alternative was implemented. If sufficient Dairy Syncline phosphate reserves are present to justify using electric shovels, a 43,000 volt transmission line could be constructed parallel to the specific transportation alternative routes to the office/shop located in Green Basin. From the office/shop site, 4,160 volt feeder lines would be run to the various pits and extended along the entire length of the pits. The surface disturbance resulting from the construction of the mining facilities would vary depending on which ore transportation development scenario is used.

Potential Development Scenario A -Truck Haulage

The description of this Potential Development Scenario is the same as Alternative 2, Dairy Syncline, Potential Development Scenario A. Table 2-9 reflects the acreages of disturbance as a result of only leasing 2,142 acres instead of the 3,259 acres discussed in Alternative 2.

Table 2-9 Potential Surface Disturbance for Leasing Dairy Syncline Tract with Potential Development Scenario A - Truck Haulage

| Description of Area of Disturbance | Estimated Acres of Disturbance |
|------------------------------------|--------------------------------|
| Pits | 490 |
| Waste Dumps | 190 |
| Haul roads (about 19 miles) | 345 |
| Tipple/Stockpile (existing) | 0 |
| Office/Shop Complex | 18 |
| Staging Area | 5 |
| Fuel/lube oil storage | 1 |
| Power lines (about 10.3 miles) | 25 |
| Silt Retention Ponds (7) | 14 |
| TOTAL DISTURBANCE | 1,088 |

Table 2-10 Potential Surface Disturbance for Leasing Dairy Syncline Tract with Potential Development Scenario B - Railroad-Truck Haulage

| Description of Area of Disturbance | Estimated Acres of Disturbance |
|------------------------------------|--------------------------------|
| Pits | 490 |
| Waste Dumps | 190 |
| Haul roads (about 14.9 miles) | 270 |
| Railroad (about 7.4 miles) | 90 |
| Tipple/Stockpile | 15 |
| Office/Shop Complex | 18 |
| Staging Area | 5 |
| Fuel/lube oil storage | 1 |
| Power lines (about 14.4 miles) | 35 |
| Silt Retention Ponds (7) | 14 |
| TOTAL DISTURBANCE | 1,128 |

Potential Development Scenario B - Railroad/Truck Haulage

The description of this Potential Development Scenario is the same as Alternative 2, Dairy Syncline, Development Scenario B (page 2-20, this Chapter). Table 2-10 reflects the acreages of disturbance as a result of only leasing 2,142 acres instead of the 3,259 acres discussed in Alternative 2.

Potential Development Scenario C -
Conveyor/Railroad/Truck Haulage

The description of this Potential Development Scenario is the same as Alternative 2, Dairy Syncline, Potential Development Scenario C.. Table 2-11 reflects the acreages of disturbance as a result of only leasing 2,142 acres instead of the 3,259 acres discussed in Alternative 2.

**Table 2-12 Potential Surface Disturbance
for Leasing Dairy Syncline Tract With Potential
Development Scenario D - Slurry Line**

| Description of Area of Disturbance | Estimated Acres of Disturbance |
|------------------------------------|--------------------------------|
| Pits | 490 |
| Waste Dumps | 190 |
| Haul roads (about 14.9 miles) | 270 |
| Wash Plant/stockpile | 25 |
| Slurry Line (about 15.7 miles) | 95 |
| Tailings Lines (about 2.6 miles) | 16 |
| Tailings Ponds | 0 |
| Office/Shop Complex | 18 |
| Staging Area | 5 |
| Fuel/lube oil storage | 1 |
| Power lines (about 10.3 miles) | 25 |
| Silt Retention Ponds (7) | 14 |
| TOTAL DISTURBANCE | 1,149 |

**Table 2-11 Potential Surface Disturbance
for Leasing Dairy Syncline Tract With Potential
Development Scenario C - Conveyor-Railroad-
Truck Haulage**

| Description of Area of Disturbance | Estimated Acres of Disturbance |
|------------------------------------|--------------------------------|
| Pits | 490 |
| Waste Dumps | 190 |
| Haul roads (about 12.4 miles) | 225 |
| Railroad (about 5.1 miles) | 62 |
| Conveyor (about 1.7 miles) | 6 |
| Tipple/Stockpile | 20 |
| Office/Shop Complex | 18 |
| Staging Area | 5 |
| Fuel/lube oil storage | 1 |
| Power lines (about 16.5 miles) | 40 |
| Silt Retention Ponds (7) | 14 |
| TOTAL DISTURBANCE | 1,071 |

Potential Development Scenario D -
Slurry Line

The description of this Potential Development Scenario is the same as Alternative 2, Dairy Syncline, Potential Development Scenario D.

Table 2-12 reflects the acreages of disturbance as a result of only leasing 2,142 acres instead of the 3,259 acres discussed in Alternative 2.

COMPARISON OF ALTERNATIVES

This section presents a comparison of the alternatives. The following tables focus on the comparison of those topics related to the issues discussed earlier in this chapter and includes effects presented in a comparative format with an explanation of the important differences among alternatives. Environmental effects of the alternatives are more fully displayed and discussed in Chapter 4 of this EIS. This section is a summary comparison.

Table 2-13 compares the acres for each ground disturbing activity for each Development Scenario of each Alternative. The acres displayed are potential direct ground disturbance that would be caused by potential mine development activities.

Generally, the acres disturbed by the Potential Development Scenarios for Alternative 5 would be less than for Alternatives 2, 3, and 4 for each of the two proposed lease tracts. This is a result of leasing fewer acres and thus the potential for disturbance by potential mine pits and waste dumps would be less. This same principal (the fewer acres leased the smaller the amount of disturbance) is true for most of the resources discussed in this EIS.

For Alternatives 2 and 4 within the Manning Creek Tract, Potential Development Scenario A represents the least amount of acres disturbed. This would result because the potential ore would be transported through the existing Smoky Canyon mine under Potential Development Scenario A for the Manning Creek Tract.

Table 2-14 presents a summary comparison of resources potentially affected by each Potential Development Scenario for each Alternative. The information presented here is a summary comparison of the data presented in detail in Chapter 4 of this EIS. The effects are after mitigation has been implemented. In many instances the acres affected and displayed in the table are much larger than the acres of ground disturbance displayed in Table 2-13, because the impacts generally reach beyond the acres of direct ground disturbance. The acres affected and displayed in Table 2-14 overlap and therefore the columns cannot be added to a total disturbance. For example, the acres of snag and log habitat affected might be the same acres as thermal cover acres affected.

The rationale for development of the Alternatives presented earlier in this Chapter (beginning on page 2-14) is also important when comparing alternatives. The rationale for the development of Alternatives is contained in the section "Alternatives Considered in Detail", Chapter 2. The rationale is not repeated here thus avoiding repetition.

As would be expected, the fewer acres leased the smaller the amount of resources affected. The other differences in the amount of acres affected are mostly a result of the Potential Development Scenarios. The potential pits and waste dumps remain in the same place for all Alternatives except for Alternative 5 which contains fewer acres in pits and waste dumps.

Potential Development Scenario A for the Manning Creek Tract offers the least effects because the potential ore transportation scenarios would be through the existing Smoky Canyon Mine. One key difference between the Alternatives is that Alternative 5 for the Manning Creek Tract would not impact about 4.6 miles of finespotted cutthroat trout stream habitat. Another difference between the Alternatives is that Alternative 3 (not leasing the Manning Creek Tract) might cause people currently working in the Smoky Canyon Mine and living in Star Valley to move to follow the mine employment opportunities. This would not happen until after the Smoky Canyon Mine is completed (this employment information is not shown in Table 2-14).

Alternative 1 would not affect the existing condition of surface resources because leasing and subsequent mining would not occur on these tracts at this time. Also, if these areas are not leased, the result could be the disturbance associated with mining on other areas of the Caribou National Forest, so impacts from this area may/probably would be shifted somewhere else. Impact, at some point in time is likely to occur, on the proposed lease tract.

Table 2-13 - Summary Comparison of Acres Disturbed for All Alternatives

| Description of Item Causing Disturbance | Alt. 1 No Lease *** | Alternative 2 | | | | Alternative 3 | | | | Alternative 4 | | Alternative 5 | | | |
|--|---------------------------------|-------------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|-------------------------------|-------------|-------------------------------|------------|--------------------------|-------------|
| | | Manning Creek Scenarios | | Dairy Syncline Scenarios | | Dairy Syncline Scenarios | | Dairy Syncline Scenarios | | Manning Creek Scenarios | | Manning Creek Scenarios | | Dairy Syncline Scenarios | |
| | | A | B | A | B | A | B | C | D | A | B | A | B | C | D |
| | | | | | | | | | | | | | | | |
| Pits | 0 | 640 | 591 | 650 | 650 | 650 | 650 | 650 | 650 | 640 | 591 | 320 | 271 | 490 | 490 |
| Waste Dumps | 0 | 140 | 140 | 300 | 300 | 300 | 300 | 300 | 300 | 140 | 140 | 140 | 140 | 190 | 190 |
| Haulroads | 0 | 39 | 39 | 345 | 270 | 225 | 270 | 225 | 270 | 39 | 39 | 18 | 18 | 345 | 225 |
| Wash Plant/Stockpile | 0 | 0 | 25 | 0 | 0 | 0 | 25 | 0 | 25 | 0 | 25 | 0 | 25 | 0 | 25 |
| Slurry Line | 0 | 0 | 150 | 0 | 0 | 0 | 95 | 0 | 95 | 0 | 150 | 0 | 150 | 0 | 95 |
| Tailings Pond | 0 | 0 | ** | 0 | 0 | 0 | ** | 0 | ** | 0 | ** | 0 | ** | 0 | ** |
| Tailings Line | 0 | 0 | 65 | 0 | 0 | 0 | 16 | 0 | 16 | 0 | 65 | 0 | 65 | 0 | 16 |
| Office/Shop Complex | 0 | 0 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 0 | 18 | 0 | 18 | 18 | 18 |
| Staging Area | 0 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 5 | 0 | 5 | 5 | 5 |
| Fuel/lube oil storage | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 |
| Powerlines | 0 | 0 | * | 25 | 35 | 40 | 25 | 25 | 25 | 0 | * | 0 | * | 25 | 25 |
| Silt Retention Ponds | 0 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 14 | 14 | 14 | 14 |
| Tipple/Stockpile | 0 | 0 | 0 | ** | 15 | 20 | 0 | ** | 0 | 0 | 0 | 0 | 0 | ** | 0 |
| Railroad | 0 | 0 | 0 | 0 | 90 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Access Road | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 35 | 0 | 0 |
| Conveyor | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Acres | 0 | 849 | 1099 | 1374 | 1414 | 1357 | 1435 | 1374 | 1414 | 849 | 1099 | 492 | 742 | 1088 | 1149 |

* = acres are included with the tailings line

** = This tailings pond is proposed in an existing pit.

*** = Although acres disturbed in the two proposed lease tract areas is 0, disturbance on other existing leases in southeast Idaho (probably within the Caribou National Forest) would occur. The impacts would be shifted from these proposed lease areas to other areas.

Table 2-14 - Summary Comparison of Resources Potentially Affected by Alternatives
 (Alternative 3 is the same as Alternative 2 for Dairy Syncline)
 (Alternative 4 is the same as Alternative 2 for Manning Creek)

| Resource Potentially Affected | Alternative 2 | | | | | | | | Alternative 5 | | | |
|--|-------------------------|---------|---------|---------|--------------------------|---------|--|--|-------------------------|---------|--------------------------|---------|
| | Manning Creek Scenarios | | | | Dairy Syncline Scenarios | | | | Manning Creek Scenarios | | Dairy Syncline Scenarios | |
| | A | B | A | B | C | D | | | A | B | C | D |
| Acres of Roadless Areas Directly Impacted | 875 | 1,129 | 1,200 | 1,190 | 1,160 | 1,190 | | | 504 | 723 | 920 | 920 |
| Acres of Roadless/ Wilderness Characteristics Potentially Lost | 2,450 | 5,150 | 1,950 | 1,800 | 1,800 | 2,200 | | | 1,250 | 3,950 | 1,250 | 1,650 |
| Recreation Acres of SPM Potentially changed to RN and Acres of Backcountry Experience Affected | 4,200 | 10,700 | 5,000 | 5,000 | 5,000 | 5,000 | | | 2,000 | 8,500 | 4,200 | 4,200 |
| Acres of ROS RN Affected | 0 | 1,400 | 3,500 | 1,450 | 1,310 | 3,450 | | | 0 | 1,400 | 1,210 | 2,550 |
| Acres of Snag and Log Habitat Affected | 850 | 950 | 700-750 | 700-750 | 700-750 | 700-750 | | | 450 | 550 | 400-450 | 400-450 |
| Acres of Aspen Habitat Affected | 350-400 | 450-500 | 400-550 | 400-550 | 400-550 | 400-550 | | | 100-150 | 200-250 | 300-400 | 300-400 |
| Acres Sage Grouse Habitat Affected | 0 | 200-250 | 100-125 | 80-120 | 70-100 | 100-135 | | | 0 | 200-250 | 70-100 | 100-135 |
| Acres of Satisfactory Thermal Cover Changed | 237 | 237 | 255 | 255 | 255 | 255 | | | 141 | 141 | 120 | 120 |
| Acres of Marginal Thermal Cover Changed | 622 | 722 | 482 | 482 | 482 | 482 | | | 312 | 412 | 365 | 365 |
| Acres of Wildlife Forage Created | 859 | 959 | 737 | 737 | 737 | 737 | | | 453 | 553 | 485 | 485 |

Table 2-14 - Continued










| Resource Potentially Affected | Alternative 2 | | | | | | | | Alternative 5 | | | |
|---|-------------------------|--------|-------|-------|--------------------------|--------|--|--|-------------------------|--------|--------------------------|--------|
| | Manning Creek Scenarios | | | | Dairy Syncline Scenarios | | | | Manning Creek Scenarios | | Dairy Syncline Scenarios | |
| | A | B | A | B | C | D | | | A | B | C | D |
| Acres Timber Production Potentially Affected | 363 | 392 | 389 | 386 | 387 | 417 | | | 332 | 361 | 302 | 330 |
| Annual Thousands Board Feet Potentially Affected | 73 | 78 | 78 | 77 | 77 | 83 | | | 66 | 71 | 60 | 65 |
| Acres of Old Growth Potentially Affected | 31 | 31 | 22 | 22 | 22 | 22 | | | 31 | 31 | 0 | 0 |
| Estimated Existing Sediment Yield (tons/year) | 50.9 | 76.9 | 41.2 | 42.4 | 40.7 | 57.4 | | | 29.5 | 51.9 | 32.6 | 46.0 |
| Estimated Mitigated Sediment Yield (tons/year) | 67.9 | 263.8 | 261.1 | 296.9 | 244.3 | 315.7 | | | 39.4 | 170.7 | 217.6 | 287.3 |
| Potential Effects (miles stream) on Fine Spotted Cutthroat Habitat | 4.5 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 |
| Suitable Acres Range Potentially Affected | 4,405 | 4,486 | 663 | 647 | 695 | 653 | | | 274 | 323 | 649 | 639 |
| Potential Sheep or Animal Unit Month's Removed | 2,088 | 2,126 | 159 | 155 | 167 | 157 | | | 130 | 153 | 155 | 153 |
| Acres of Scenic Quality and Viewer Sensitivity Potentially Affected | 4,000 | 14,800 | 9,200 | 9,900 | 9,100 | 12,600 | | | 2,200 | 13,000 | 7,300 | 10,700 |

Table 2-14 - Continued

| Resource Potentially Affected | Alternative 2 | | | | | | Alternative 5 | | | | | |
|---|-------------------------|-----|-------|--------------------------|-------|-------|-------------------------|-----|-----|--------------------------|-----|-----|
| | Manning Creek Scenarios | | | Dairy Syncline Scenarios | | | Manning Creek Scenarios | | | Dairy Syncline Scenarios | | |
| | A | B | A | B | C | D | A | B | A | B | C | D |
| | | | | | | | | | | | | |
| Unstable and Marginally Unstable Acres Affected | 41 | 64 | 162 | 174 | 156 | 186 | 41 | 64 | 123 | 135 | 117 | 147 |
| Acres of Moderate Surface Erosion Hazard Affected | 617 | 762 | 1,061 | 1,065 | 1,025 | 1,066 | 373 | 518 | 819 | 823 | 783 | 824 |
| Acres of High Surface Erosion Hazard Affected | 232 | 234 | 307 | 322 | 294 | 298 | 119 | 121 | 263 | 278 | 250 | 254 |
| Phosphate Reserves (estimated millions of tons) | 30 | 30 | 20 | 20 | 20 | 20 | 20 | 20 | 13 | 13 | 13 | 13 |

Figure 2-1
Manning Creek
Lease Tract
Alternatives 2 & 4

LEGEND

| | |
|---|----------------------------------|
|  | Proposed Lease Tract |
|  | Gravel Road |
|  | Improved Dirt Road (3C) |
|  | Improved Road (Dirt Surface) |
|  | Unimproved Dirt Road |
|  | Uncoded Road |
|  | Trail |
|  | Section Lines (Township & Range) |
|  | Drainages |

N

Map Source: Caribou
 National Forest
 GIS Library, 2/97

Caribou National Forest
 Phosphate Lease
 Environmental Impact Statement
 U.S. Forest Service and
 Bureau of Land Management

Scale

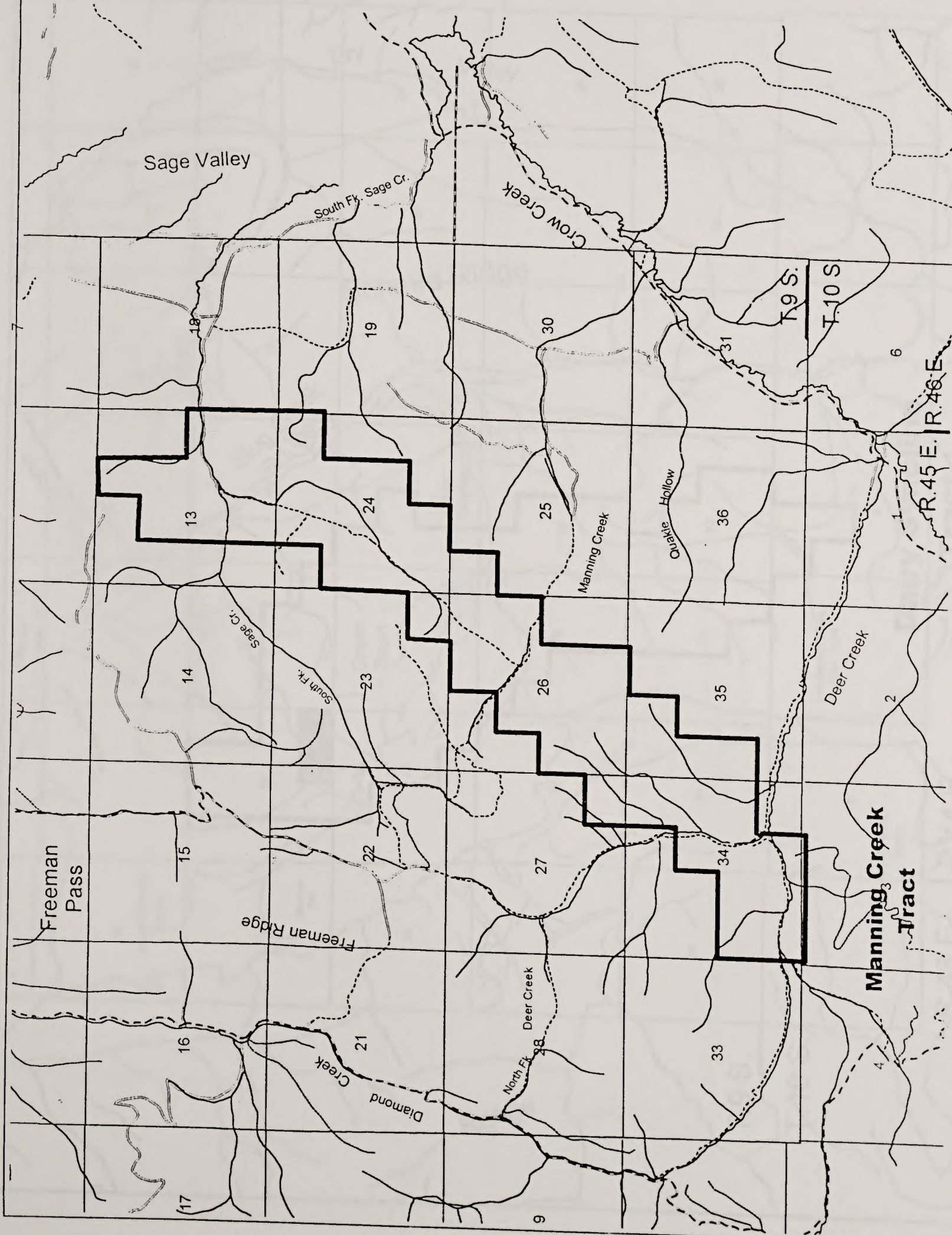
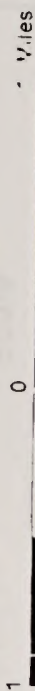
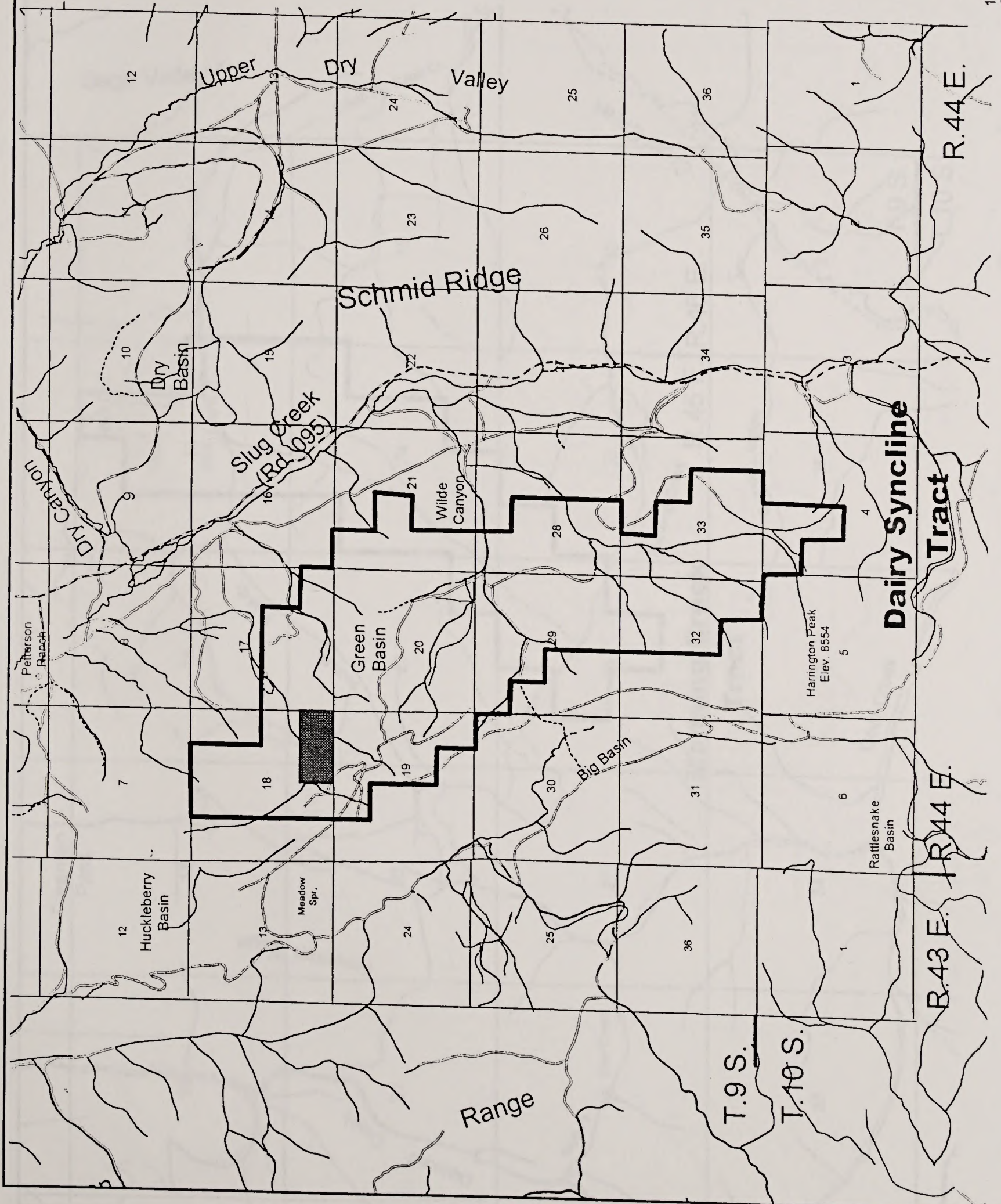


Figure 2 - 2
Dairy Syncline
Lease Tract
Alternatives 2 & 3



LEGEND

- Proposed Lease Tract
- Existing Lease
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- - - Trail
- Section Lines (Township & Range)
- Drainages

Δ

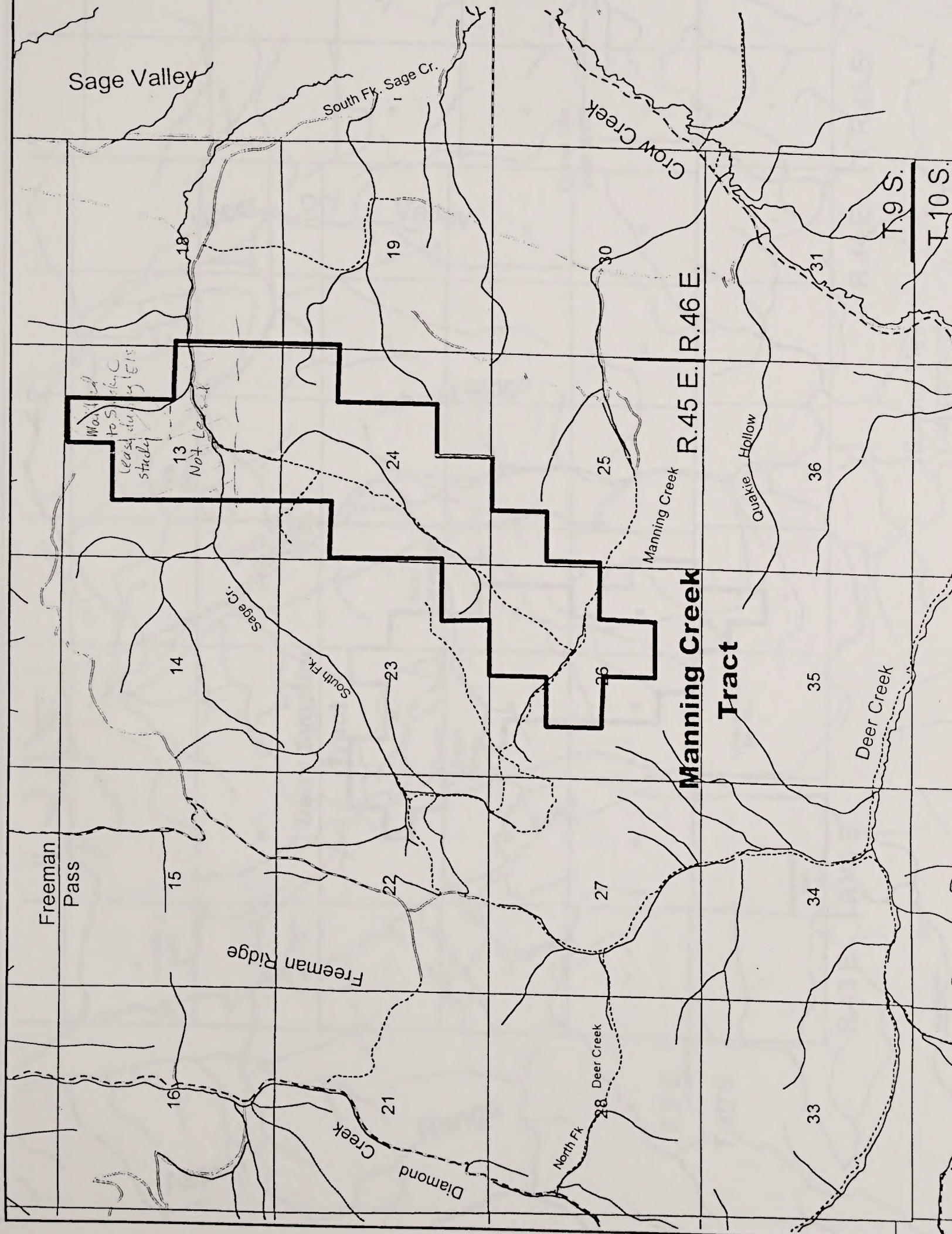
Map Source: Caribou
National Forest
GIS Library, 2/97

Caribou National Forest
Phosphate Lease
Environmental Impact Statement
U.S. Forest Service and
Bureau of Land Management

Scale



Figure 2 - 3
Manning Creek
Lease Tract
Alternative 5



LEGEND

- Proposed Lease Tract
- ▲ Gravel Road
- ▲ Improved Dirt Road (3C)
- ▲ Improved Road (Dirt Surface)
- ▲ Unimproved Dirt Road
- ▲ Uncoded Road
- ▲ Trail
- Section Lines (Township & Range)
- ▲ Drainages

A

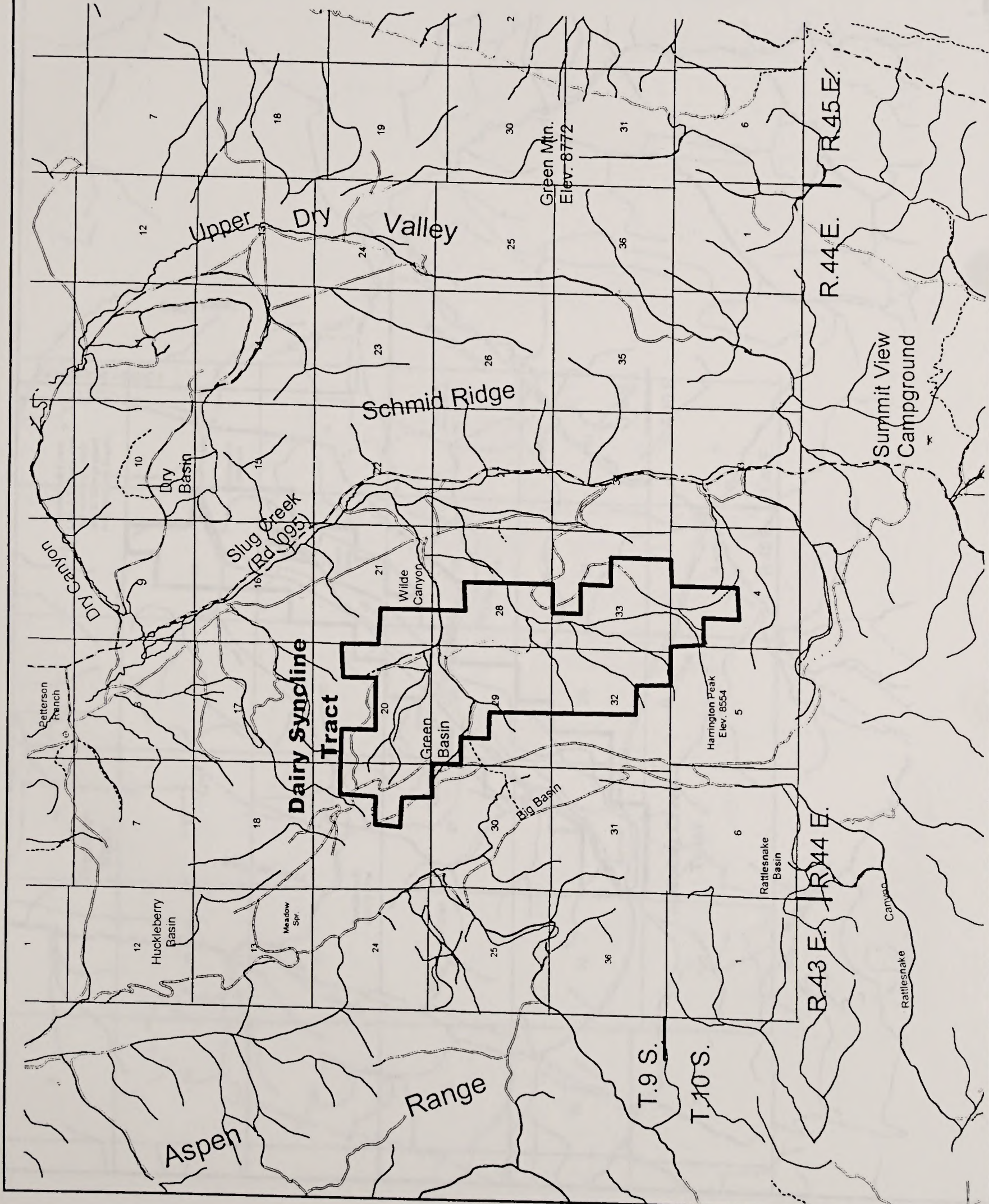
Map Source: Caribou
National Forest
GIS Library, 2/97

Caribou National Forest
Phosphate Lease
Environmental Impact Statement
U.S. Forest Service and
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Scale



Figure 2 - 4
Dairy Syncline
Lease Tract
Alternative 5



LEGEND

- Proposed Lease Tract
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Drainages

N

Map Source: Caribou
National Forest
GIS Library, 2/97

Caribou National Forest
Phosphate Lease
Environmental Impact Statement
U.S. Forest Service and
Bureau of Land Management

Scale

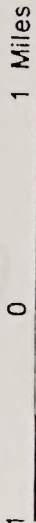
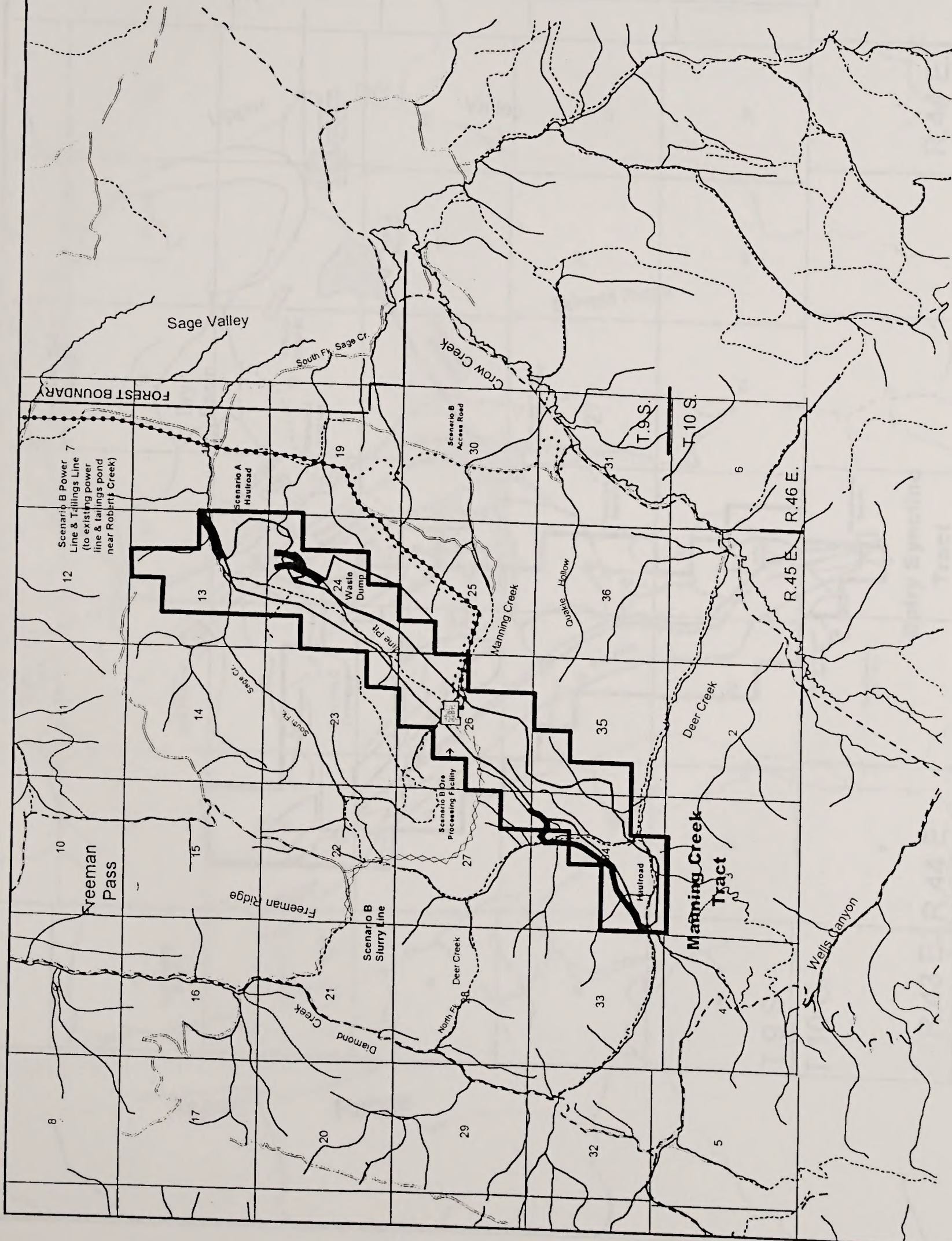


Figure 2-5
Manning Creek Tract
Mine Development
Scenarios A & B



LEGEND

- Proposed Lease Tract
- Scenario B Powerline & Tailings Line
- Scenario B Shop/Ore Processing
- Haulroads
- Scenario B Slurry Line
- Scenario B Access Road
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Drainages

Map Source: Caribou
 National Forest
 GIS Library, 2/97

Caribou National Forest
 Phosphate Lease
 Environmental Impact Statement
 U.S. Forest Service and
 Bureau of Land Management

Scale



Figure 2-6
Dairy Syncline Tract
Mine Development
Scenarios A, B, C, & D

LEGEND

- Proposed Lease Tract
- Existing Lease
- Mine Pits & Waste Disposal Areas
- Tailings Line
- Slurry Line
- Haulroads (Scenarios A, C, & D similar except where noted)
- Scenario A Haulroad
- Scenario C Haulroads
- Scenario D Haulroads
- Scenario B Railroad
- Scenario C Railroad
- Scenario C Conveyor
- Scenario B Tipple; C Service; D Wash Plant
- Scenario C Stockpile
- Scenario C Tipple
- Tailings Pond #1
- Tailings Pond #2
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)

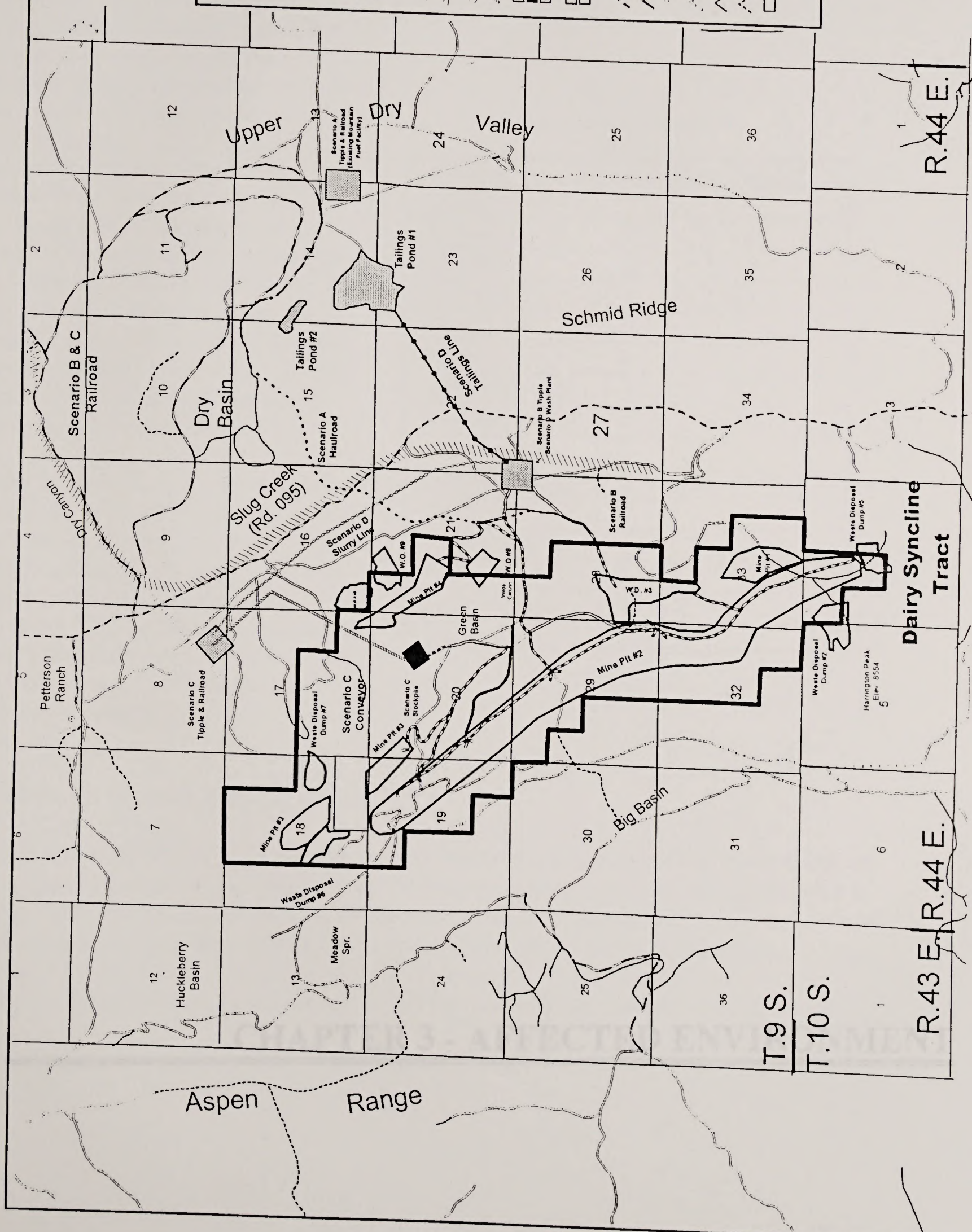
Map Source: Caribou
 National Forest
 GIS Library, 2/97

Caribou National Forest
 Phosphate Lease
 Environmental Impact Statement
 U.S. Forest Service and
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Scale

0

1 Miles



CHAPTER 3 - AFFECTED ENVIRONMENT

INTRODUCTION

The purpose of this chapter is to describe the existing condition of the physical, biological, social and economic resources of the environment that may be affected by the implementation of any of the alternatives. Separate background reports were prepared for some resources discussed below. These reports are part of the planning record located in the Forest Supervisor's Office. The information in this Chapter serves as a "true log" by which to measure the potential effects of the alternative resources in Chapter 4 (Environmental Consequences). All resources within the project are addressed, however, the focus is on the resources related to the key issues. The existing condition of the resources also provides the context for assessing how the alternative might affect the issues. All maps (Figures) referenced in this Chapter are located at the end of the Chapter.

The order in which the resources are listed of the affected environment appears in this Chapter corresponds with the order of the maps as presented in Chapter 2. Figures 1-1 through 1-4 are presented in this chapter to provide the relationship of the resources and the project area. The affected environment for Issue 1, Roadway Area, is presented in the resource section titled "Roadway Area" ("Roadway Area").

FOREST PLAN MANAGEMENT DIRECTION

The Forest Plan, which is the Forest Land and Resource Management Plan, 1984, provides all natural resource management, including and encompasses management, standards and guidelines for the Carson National Forest. The Forest Plan describes resource management practices, levels of resource production, and the availability and suitability of lands for resource management. The Forest Plan provides Forest-wide goals, objectives, standards and guidelines. Appendix 1 highlights the Forest-wide goals and objectives and the standards and guidelines that are

Table 3-1
Summary of Resources
in the Area

| Resource | Page Number |
|----------------------|-------------|
| Forest Resources | 1 |
| Biological Resources | 2 |
| Water | 2, 3, 4, 5 |
| Vegetation | 2, 3, 4, 5 |
| Wildlife/Habitat | 2 |
| Recreation | 2 |
| Historical Resources | 2 |
| Forest Resources | 2, 3, 4 |
| Geological Resources | 2 |
| Cultural Resources | 2 |
| Soils | 2 |
| Climate/Weather | 2 |
| Land Use | 2 |

CHAPTER 3 - AFFECTED ENVIRONMENT

CHAPTER 3 - AFFECTED ENVIRONMENT

INTRODUCTION

The purpose of this chapter is to describe the existing condition of the physical, biological, social and economic resources of the environment that may be affected by the implementation of any of the alternatives. Separate background reports were prepared for most resources discussed below. These unpublished reports are part of the planning records located in the Forest Supervisor's Office. The information in this Chapter serves as a "base line" by which to measure the potential effects of the alternatives discussed in Chapter 4 (Environmental Consequences). All resources relevant to this project are addressed; however, discussions focus on the resources related to the key issues. The existing condition of the resources also provides the context for assessing how the alternatives respond to the issues. All maps (Figures) referenced in this Chapter are located at the end of this Chapter.

The order in which the resource description of the affected environment appears in this Chapter corresponds with the order of the issues as presented in Chapter 2. Table 3-1 displays the relationship of the resources and the issues (i.e., the affected environment for Issue 1, Roadless Areas, is contained in the resource section under the heading "Roadless Resources").

Table 3-1
Relationship of Resources
To Issues

| Resource | Issue Number |
|--------------------|--------------|
| Roadless Resources | 1 |
| Recreation | 2 & 7 |
| Wildlife | 3, 4, & 7 |
| Vegetation | 3, 4, & 7 |
| Water Quality | 4 |
| Fisheries | 4 |
| Wetlands/Riparian | 4 |
| Range Livestock | 5 & 6 |
| Socioeconomic | 6 |
| Cultural Resources | 7 |
| Air Quality | |
| Visual Resources | |
| Soils | 4 |
| Minerals/Geology | |
| Transportation | |

FOREST PLAN MANAGEMENT DIRECTION

The Forest Plan (Caribou National Forest Land and Resource Management Plan, 1985) guides all natural resource management activities and establishes management standards and guidelines for the Caribou National Forest. This Forest Plan describes resource management practices, levels of resource production, and the availability and suitability of lands for resource management. The Forest Plan provides Forest-wide goals, objectives, standards and guidelines. Appendix F highlights the Forest-wide goals and objectives and the standards and guidelines that are most

relevant to the issues, proposed action, and alternatives presented in this EIS. However, all Forest Plan direction still applies.

The Inland Native Fish Strategy decision amended the management direction established in all land and resource management plans for the area covered by the assessment. This amendment is part of the Forest Plan management direction.

ROADLESS RESOURCES

Introduction

The purpose of this section is to identify and inventory the roadless resources in the analysis area (Figures 3-1, 3-2, and 3-3 located at the end of this Chapter). This section describes the existing environment as it relates to Issue 1.

Issue 1 The effects of phosphate leasing and subsequent exploration, mining, and development activities on the roadless area characteristics and wilderness features.

Background to the Roadless Issue

Two decisions suggest that development entries into roadless areas may be a significant impact on the environment:

1. The Ninth Circuit Court decision California v. Block (1982) required that the Forest Service fully analyze specific impacts of non-wilderness management before making an irreversible and irretrievable decision to commit a roadless area to such management.
2. The 1988 decision by the Chief of the Forest Service on the appeals (#2130) of the Idaho Panhandle National Forests Plan decided that Forest Plans do not make the irreversible or irretrievable decision to commit such areas to non wilderness. Site-specific environmental analysis is necessary to make such decisions.

In conjunction, these two decisions mean that a site-specific environmental analysis is necessary for all projects such as phosphate leasing that may lead to development in roadless areas. The 1992 revision of the Forest Service NEPA Handbook (1909.15, section 20.6) formalizes this requirement.

The issue involves the undeveloped condition of roadless areas and their potential for future wilderness consideration. It also involves the potential effects of exploration, mining, and development on the roadless character and wilderness potential of the area. The issue is

important to many people who want roadless areas kept as such or to be recommended for wilderness. It is equally important to others who want them developed, managed, and made accessible and usable to the public.

The indicators of the roadless issue come from the Wilderness Act and are used by the Forest Service to analyze a roadless area's eligibility for wilderness.

Wilderness is specifically defined in the Wilderness Act of 1964 (P.L. 88-577)(Section 2.(c)) as follows:

"(c) A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man substantially unnoticeable; (2) has outstanding opportunities of solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. (16 U.S.C. 1131)"

Roadless areas qualify for placement on the inventory of potential wilderness if, in addition to meeting the statutory definition of wilderness, they meet one or more of the following criteria (Forest Service Handbook 1909.12, amendment #1, August 3, 1992):

1. They contain 5,000 acres or more.
2. They contain less than 5,000 acres but:
 - a. Due to physiography or vegetation, they are manageable in their natural condition.
 - b. They are self-contained ecosystems such as an island.
 - c. They are contiguous to existing wilderness, primitive areas, Administration-endorsed wilderness, or roadless areas in other Federal ownership, regardless of their size.
3. They do not contain improved roads maintained for travel by standard passenger-type vehicles except as permitted in areas east of the 100th meridian.

Project planning such as this EIS must analyze site-specific impacts on the roadless condition and wilderness potential. The Forest Service would reevaluate roadless areas for potential wilderness recommendation when the Forest Plan is updated.

Roadless Area Characteristics/Wilderness Features

Roadless area characteristics and wilderness features include: natural integrity, apparent naturalness, remoteness, solitude, special features, and manageability/boundaries and are defined as follows:

Natural integrity is the extent to which long-term ecological processes are intact and operating. Impacts to natural integrity are measured by the presence and size of human-induced change to an area. Such impacts include physical developments e.g., roads, utility rights-of way, fences, lookouts, cabins, recreation and mineral developments, domestic livestock grazing, wildlife/fisheries management activities, vegetation manipulation, and fire suppression activities.

Apparent naturalness means that the environment looks natural to most people using the area. It is a measure of importance of visitors' perceptions of human impacts to the area. Even though some of the long-term ecological processes of an area may have been interrupted, the landscape of the area generally appears to be affected by the forces of nature. If the landscape has been modified by human activity, the evidence is not obvious to the casual observer, or it is disappearing due to natural processes.

Remoteness is a perceived condition of being secluded, inaccessible, and "out of the way". The physical factors that can create "remote" settings include topography, vegetative screening, distance from human impacts such as roads and logging operations (sight and sound), and difficulty of travel. A user's sense of remoteness in an area is also influenced by the presence or absence of roads, their condition, and whether they are open to motorized vehicles.

Solitude is a personal, subjective value defined as isolation from the sights, sounds, and presence of others and the developments of man. Common indicators of solitude are numbers of individuals or parties one may expect to encounter in an area during a day, or the number of parties camped within sight and sound of other visitors. A primitive recreation experience includes the opportunity to experience solitude, a sense of remoteness, closeness to nature, serenity, and spirit of adventure through the application of woodsman skills in an environment that offers a high degree of challenge and risk. Such opportunities are normally found in Primitive and Semi-Primitive Non-Motorized classes of the Recreation Opportunity Spectrum (USDA Forest Service, 1982). Impacts related to primitive recreation experiences are normally expressed in changes to the physical setting, activities occurring in the area, or to the social experiences of users.

Special Features are unique geological, biological, ecological, cultural, or scientific features located in a roadless area. Unique fish and wildlife species, unique plants or plant communities, potential Research Natural Areas, outstanding landscape features such as unique rock formations, and significant cultural resource sites are some items that should be considered when analyzing this element.

Manageability/Boundaries element relates to the ability of the Forest Service to manage an area to meet the size criteria and the five elements discussed above. Changes in shape of an area influence how it can be managed. If broken into narrow corridors or small islands interspersed with areas of nonconforming management practices, many of the six elements may be compromised. To meet the requirements of size, an area must be at least 5,000 acres. This is especially important if a proposed action would essentially road the interior of a small roadless area. Changes in the shape of roadless areas and the location of other proposed projects outside the area are also factors that should be considered. Boundary management impacts relate to such factors as the need to change boundaries to match terrain features that can easily be located on the ground. The provision for access to the remainder of the roadless area changes with trailhead locations, motorized access patterns, etc.

Special Places - Special Values relates to subjective values and are places or activities identified by people during scoping. They are places people hold specific values for or places where people engage in activities they consider special when visiting that place. While these are not part of the six wilderness characteristics, they are important to people, and a proposal that changes these characteristics would change their experiences.

Past Inventories

In 1979, the Roadless Area Review and Evaluation (RARE II) inventoried roadless areas on National Forest System lands. The purpose of RARE II was to identify all lands exhibiting wilderness characteristics that would be considered for inclusion in the National Wilderness Preservation System. During Forest Planning and before the completion of the Forest Plan in 1985, an inventory of lands that were essentially unroaded and undeveloped was completed. This inventory found areas meeting the minimum definition of wilderness, and qualified for wilderness evaluation according to the National Forest Management Act (NFMA) Regulation 219.17. The inventory contained 34 roadless areas totaling 775,251 acres on the Caribou National Forest (USDA Forest Service, 1985b, pg. II-28). This inventory and description of each area are contained in Appendix C of the Forest Plan Final Environmental Impact Statement (USDA Forest Service, 1985a). A copy is part of the planning records for this Phosphate Leasing EIS.

During the Forest planning reevaluation process some areas were found to have roads and other development thus reducing the areas to the 775,251 acres discussed above available for further study. This EIS will evaluate the effects of phosphate leasing and potential exploration, mining,

and development on three Forest Service Roadless Areas containing 72,430 acres as shown on the maps at the end of this chapter (Figures 3-1, 3-2, and 3-3).

The existing condition of the Dry Ridge, Huckleberry Basin, and Sage Creek Roadless Areas has been updated as part of the phosphate leasing analysis process. Generally, the Roadless Area characteristics and Wilderness Features were rated moderate to low during the initial RARE II inventory and again in the Forest Planning inventory update. Many development activities have taken place within these roadless areas since completion of the Forest Plan, and the ratings are lower now.

Meade Peak Roadless Area is not included as part of this analysis because there would be no additional direct or indirect impacts on the roadless characteristics of this area due to leasing, mining, or potential development scenarios.

Affected Environment (existing condition)

Dry Ridge Roadless Area Number 04164 (24,420 acres)

The Dry Ridge Roadless Area is within Caribou and Bear Lake Counties, Idaho, on the Soda Springs and Montpelier Ranger Districts of the Caribou National Forest approximately 14 miles east of Soda Springs, Idaho (Refer to Figure 3-1).

The major access roads to the area are the Diamond Creek Road that parallels the northern portion of the eastern border, the Georgetown Canyon Road along the southern portion of the east border and the south, and the Slug Creek Road on the west. Other roads to the area are the Left Fork of the Georgetown Canyon Road from the southwest and the Dry Canyon Road from the west. There are approximately 19 miles of trails within the roadless area.

The topography includes the high, rather uniform, Dry Ridge at about 8,000 feet in elevation, although 50 percent of the area is gently sloping down to about 6,500 feet in elevation. The vegetative cover includes wet and dry meadows, sagebrush, grasslands, mountain brush, aspen, and conifer timber stands on north and east-facing slopes. The potential natural vegetation ecosystem types identified by Bailey and Kuchler are M3110-49-Sagebrush Steppe and M3110-11 Douglas-fir Forest (USDA Forest Service, 1985a, pg. C-95).

Approximately 2,000 acres of the Dry Ridge area are covered by current phosphate leases. Considerable phosphate exploration work has been done within and next to the area. Recent mining has occurred north of the area in Mabey Canyon. Nu West has finished mining on the 1,040 acres leased in portions of Sections 14 and 23-26, Township 9 South, Range 44 East that is outside of but almost surrounded by the the roadless area (refer to Figure 3-1). Patented mining claims border the area on the south. Currently, there are no oil and gas leases or active mining claims within the Dry Ridge Roadless Area.

A phosphate exploration road (about four miles long) has been constructed from Diamond Creek up past Green Mountain and along Dry Ridge. This road fragments an estimated 1,462 acres from the rest of the roadless area. An additional road has been constructed approximately two miles from the Slug Creek Road to Cold Springs. This road connects with the Mountain Fuel phosphate mine development. These two developments fragment the roadless area leaving an area to the west isolated from the rest of the roadless area.

Large volumes of insect-killed lodgepole pine are standing in the Diamond Creek drainage portion of the area. Salvage operations have harvested post, pole, sawtimber, and firewood adjacent to roads. Timber harvest has been completed in Hess Park (about 87 acres) and Stewart Timber Sale (about 178 acres) areas. A railroad goes north from the Mountain Fuel Mine along the edge of and sometimes encroaching on the roadless area boundary.

Nearly all the area is grazed by cattle or sheep (USDA Forest Service, 1985a, pg. C-96).

The manageability of the area along inventoried boundaries is difficult. The present boundaries follow manmade features and surveys, including road intrusions into the area and the exterior Forest boundary.

Natural integrity has been affected by the following physical or human-caused impacts: trails, fences, mineral development, and other fixed-site facilities. Natural integrity is low due to the Cold Springs Road and the Mountain Fuel Mine (about 996 acres). From Dry Ridge, the nearby railroad line to the Mountain Fuel Mine, power line, slurry line, Hess Park Timber harvest areas, grazing, and range improvements diminish natural integrity.

The apparent naturalness is low to moderate because of the manmade facilities or management activities in the area. Mineral exploration on Dry Ridge, some recreational activities, moderate grazing activities, some stock watering ponds and troughs, road construction, timber harvest and the Mountain Fuel Mine detract from the natural appearance of the area.

The opportunity for solitude is low because of the moderate size, minimal topographic and vegetative screening, and short distances from the perimeter to the center of the roadless area. Phosphate mining activity is visible from many sites within this area.

The opportunities for remoteness are minimal because of the moderate size, number of road corridors projecting into the area, minimal topographic and vegetative screening, and the moderately developed facilities present.

Unique or special features are not present. Special places or special values were not identified. There is no state or private land within this roadless area.

This roadless area was not recommended for wilderness by the State of Idaho or included in wilderness legislation for Idaho. During the roadless area reevaluation, no input was received specific to this area that recommended wilderness classification.

Huckleberry Basin Roadless Area Number 04165 (30,560 Acres)

The Huckleberry Basin Roadless Area is within Caribou and Bear Lake Counties, Idaho, on the Soda Springs and Montpelier Ranger Districts of the Caribou National Forest approximately 6 miles east of Soda Springs, Idaho (Refer to Figure 3-2).

Several roads provide access to the roadless area. The Johnson Creek and Paterson Canyon Roads provide access from the north. The east side is paralleled by the Slug Creek Road. The Left Fork of the Georgetown Canyon Road and the Red Pine Canyon Road provide access from the southern boundary. Access roads on the west include the Big Canyon, Rattlesnake Canyon, Ninemile Creek, Fossil Canyon, Dry Canyon, and Sulphur Canyon Roads.

The general topography of the area ranges from gentle to very steep. The elevation varies from 8,554 feet at Harrington Peak to about 6,000 feet near Big Canyon. The vegetation cover of the area is dominated by sage and grass at the lower elevations with mountain brush, aspen, and patches of Douglas-fir and lodgepole pine timber on north and east-facing slopes. The potential natural vegetation ecosystem types identified by Bailey and Kuchler are M3110-49 Sagebrush Steppe and M3110-11-Douglas-fir Forest (USDA Forest Service, 1985a, pg. C-101).

Elk, deer, moose, and grouse are the principal game species. The foothills along the west edge of the roadless area are important deer winter range. Most of the area is grazed by livestock.

Recreational activities that are the most prevalent include big game and upland bird hunting, and gathering forest products. Activities of moderate amounts of use include snowmobiling, dispersed camping, and hiking. Light recreation use occurs with trail bikes and Nordic skiing (USDA Forest Service, 1985a, pg. C-102).

There are patented phosphate claims next to the northwest boundary. Phosphate exploration activities have taken place in the past.

The manageability of the area along inventoried boundaries is poor. The present boundaries follow manmade features and surveys including road intrusions into the area and the exterior Forest boundary. The area includes several low standard roads (totaling about 236 acres) used for phosphate exploration, timber harvest, and recreational activities. Four timber sales, encompassing about 7,000 acres, have been completed in recent years, they are; Big Basin, Huckleberry Basin, Hole, and Upper Fossil. These activities have caused a considerable amount of fragmentation.

Natural integrity is low and has been affected by the following physical or man-caused impacts: grazing, recreation, timber harvest, phosphate exploration and improved roads. The Harrington Peak and Big Basin roads split the area in half (north to south).

The appearance of manmade facilities or management activities such as existence of some old phosphate trenches, stock watering ponds, trails, fences, timber harvest, and associated roads in the area detracts from the natural appearance. Apparent Naturalness is low.

The opportunities for solitude are low because of the fragmentation, moderate topographic and vegetative screening, and short distances from the perimeter to the center of any undisturbed area. Visual evidence of timber harvest activity exists over a large portion of the area.

Opportunities for remoteness are minimal. Unique or special features are not present, and special places and special values were not identified.

There are 156 acres of state or private lands within this roadless area.

This roadless area was not recommended for wilderness by the State of Idaho or included in wilderness legislation for Idaho. During the roadless area reevaluation, no input was received specific to this area that recommended wilderness classification.

Sage Creek Roadless Area Number 04166 (17,450 Acres)

The Sage Creek Roadless Area is within Caribou County, Idaho, on the Soda Springs and Montpelier Ranger Districts of the Caribou National Forest approximately 10 miles south-west of Afton, Wyoming (Refer to Figure 3-3).

The northern border of the Sage Creek Roadless Area is reached by the Timber Creek and Smoky Canyon Roads. The Pole Canyon, Sage Creek, and Crow Creek Roads parallel or approach the area from the east. The Wells Canyon Road forms the southwest border. The Diamond Creek and Freeman Pass Roads parallel the west border of the area. There are approximately 21 miles of developed trails within the area.

The Sage Creek Roadless Area is characterized by moderate to steep slopes and primarily north and south-trending ranges. Elevations vary from over 8,700 feet north of Pole Canyon down to about 6,700 feet near Crow Creek. The potential natural vegetation ecosystem type identified by Bailey and Kuchler is M3110-11-Douglas-fir Forest (USDA Forest Service, 1985a, pg. C-107). Vegetative cover is primarily Douglas-fir and lodgepole pine conifer timber with aspen, mountain brush, and sagebrush and grass on west and south aspects. Much of the lodgepole pine is mature and insect infested. Some salvage logging has occurred in areas next to existing roads and on the two timber harvests within the area.

The entire area is grazed by cattle or sheep. The area is important wildlife habitat supporting elk, deer and moose.

A forest visitor attraction here is big game hunting and fuelwood gathering. The Smoky Canyon Mine that is being actively developed within the boundary attracts many more recreation visitors than would normally come to the area. All other recreation use is light. These include hiking, upland bird hunting, dispersed camping, horseback riding, fishing, snowmobiling, and trail biking (USDA Forest Service, 1985a, pg. C-108).

There are currently no oil and gas leases in this roadless area. The area is rich in phosphate reserves and contains portions of existing leases and an active phosphate mine.

A 161 KV power line exists near the northeast border. There is a Special Use Permit on approximately two acres within the area for a fence and another for mine waste dumps. Pole Canyon (715 acres) and South Fork (1,298 acres) timber sales have been completed within this area. The Smoky Canyon mine has been developed (1,308 acres) within the roadless area and the Manning Creek exploration has impacted about 1,299 acres. Roads have been constructed within the area in the Manning Creek, Sage Creek, and Pole Canyon drainages. Roads also exist near the headwaters of the South Fork of Sage Creek and adjacent to a tributary to Timber Creek in Section 26, Township 8 South, Range 45 East.

The manageability of the area along inventoried boundaries is poor because of the existing roads within the area. The present boundaries generally follow manmade features and surveys causing the area to include road intrusions within the exterior boundary of this roadless area. Boundary adjustments would not eliminate conflicts. The width of the area remaining after the boundary adjustments would be less than one and one-half miles. The phosphate exploration road near Manning Creek and the timber harvest roads near the headwaters of Sage Creek, the South Fork Sage Creek, and on the north end of the area have fragmented the area thus further reducing the roadless/wilderness characteristics. Development activities have caused extensive fragmentation.

Natural integrity is moderate except where it has been affected by the following physical or man-caused impacts: range improvements, prescribed fire, timber harvest, grazing, phosphate exploration, and mine development.

The appearance of manmade facilities or management activities such as grazing and recreation activities, roads, mineral exploration, and mining within the area detracts from the natural appearance. Apparent naturalness is low to moderate.

The opportunities for solitude are low because of the small size of the area. Road intrusions, moderate topographic and vegetative screening, close distances from the perimeter of the area, and roads to the center of undeveloped areas further reduce the opportunities for solitude.

Opportunities for remoteness are low because of the small area size, road corridors projecting into the area, moderate topographic and vegetative screening, and other manmade intrusions.

Unique or special features are not present, and special places and special values were not identified.

There are approximately 640 acres of state or private lands within this roadless area.

This roadless area was not recommended for wilderness by the State of Idaho or included in wilderness legislation for Idaho. During the roadless area reevaluation, no input was received specific to this area that recommended wilderness classification.

RECREATION RESOURCES

Introduction

This section describes the recreation opportunities and experiences within the study area on the Caribou National Forest that would be affected by the proposed phosphate leasing and subsequent mining and development activities.

This section describes the existing environment as it relates to issue number 2:

Issue 2 The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on backcountry recreation and hunting opportunities and experiences.

The study area offers diverse recreational opportunities for those forest visitors seeking a dispersed type of recreation opportunity. Recreation opportunities include:

- individual dispersed camping
- Off-Highway Vehicles (OHV) and All Terrain Vehicles (ATV)
- hunting, fishing
- hiking, biking
- scenery viewing
- Nordic skiing, snowmobiling
- gathering forest products

A recreation resource inventory of Recreation Opportunity Spectrum (ROS), recreation sites and places, major recreation activities, and estimates of user volume for the study area was conducted using the methodologies and guidelines of the Forest Service ROS (USDA Forest Service, 1974) and personal interviews with the Caribou National Forest recreation specialist. The purpose of this inventory was to establish and document the existing recreation qualities of the study area for

the Phosphate Leasing proposal to assess the existing condition and potential effects of proposed phosphate leasing, mining, and development on recreation experiences and opportunities.

Recreation Opportunity Spectrum

ROS is composed of six classes describing possible combinations of activities, settings, and probable recreation experience opportunities. This system was developed by the Forest Service to analyze both the physical setting and the recreation use/experience as factors that affect the availability and quality of recreation opportunities (USDA Forest Service, 1974). The ROS system defines recreation opportunities as:

- primitive
- semiprimitive-nonmotorized
- semiprimitive-motorized
- roaded natural
- rural
- urban

The six classes provide a framework for defining the outdoor recreation opportunity environment. For the purposes of this analysis the ROS classifications of urban, rural, primitive, and semi-primitive nonmotorized are not discussed, because they do not exist within the study area. These opportunities vary from primitive wilderness areas with only minimal modifications of the environment to highly developed sites that have greatly modified the physical environment.

Semi-primitive Motorized (SPM) - A predominately natural or natural-appearing environment. Although concentration of use is low, evidence of human activity can be observed throughout the area. A moderate probability of experiencing isolation from other user groups exists, and opportunities for challenge and risk are available. The setting may have subtle modifications, but they remain visually unobtrusive to users traveling the trails and primitive roads in the area. Motorized travel is allowed.

Semi-primitive Motorized areas are dispersed throughout the study area and usually occur at a distance greater than one half mile from highly modified, constructed roads. The SPM areas also generally exist where primitive roads and trails are found. Refer to the ROS Maps (Figures 3-4 and 3-5) at the end of this chapter for an illustration of where the SPM areas occur.

Within the Manning Creek portion of the study area, the entire lease tract and most of the study area that would be affected is Semi-primitive Motorized. Within the Dairy Syncline portion of the study area, the amount of Semi-Primitive Motorized classification is about one half of the area, however, most of the proposed lease tract is within a Semi-primitive Motorized area (Refer to Figures 3-4 and 3-5).

Roaded Natural (RN) - A predominately natural-appearing environment with moderate evidence of human activity. An equal probability of experiencing isolation from or affiliation with other user groups exists. There are opportunities for a high degree of interaction with the natural environment, but opportunities for challenge and risk are minimal. Resource modification and utilization are evident but harmonize with the natural environment. From sensitive (sensitivity is a measure of people's concern for the scenic quality of the area) travel routes and use areas, these alterations should remain visually subordinate.

Roaded Natural areas consist of gravel roads and primitive Forest Service roads that form a large network throughout the study area. Most of the gravel roads and primitive Forest Service roads lead to dispersed recreation areas, grazing allotments, mining exploration and development, and timber sales.

Not all Forest Service primitive roads in the study area are classified as RN; however, in areas of popular and commonly used developed recreation sites and dispersed areas, the primitive roads are considered RN within the ROS classification.

Within the Manning Creek portion of the study area, large areas along Diamond Creek Road (Road Number 102) and Crow Creek Road (Road Number 111) are Roaded Natural Appearing (Refer to Figure 3-4).

Within the Dairy Syncline portion of the study area, large areas along Slug Creek Road (Road Number 095) and Harrington Peak Road are Roaded Natural Appearing (Refer to Figure 3-5).

Recreation Activities

Recreational uses that occur in the study area are: Camping, fuelwood gathering, viewing scenery, off highway vehicle (ATV) travel, hiking, horse back riding, Nordic skiing, and snowmobiling.

Big game hunting is a popular and major recreation activity for local residents and nonresidents alike within the study area. Rifle hunting for Mule Deer is the most common activity. The area is popular for deer and bull elk hunting.

Recreation Sites and Places

Developed Sites There are no developed recreation sites within the proposed lease tracts or the potential development scenarios of the study area.

Diamond Creek Campsite began as a Civilian Conservation Corp camp. Improvements include restrooms, water, tables, and cleared/constructed camp/trailer sites. However, this is not a "fee"

area. Now the site is a heavily used, developed recreation area. Local publics, i.e. 100 mile radius, consider Diamond Creek to be an important recreation area. When speaking of Diamond Creek, most people have either heard of it or have visited the drainage (USDA Forest Service, 1987).

Summit View, a 23 unit campground, is located next to the southwest boundary of the Dry Ridge Roadless Area. Dry Ridge receives moderate use for big-game hunting and light use for hiking, four-wheel drive recreation, dispersed camping, and gathering forest products. Forest visitors access the area by the loop road from Georgetown Canyon into Diamond Creek and Stewart Flat for the driving pleasure opportunities it affords.

Dispersed Recreation Areas The study area receives moderate amounts of recreational use. Dispersed use areas within the Manning Creek tract study area are; Manning Creek, South Fork Sage Creek, Deer Creek, North Fork Deer Creek, Upper Diamond Fork, and Sage Meadows.

Use within the Manning Creek Tract is low. Private land borders the National Forest to the east and restricts access somewhat. Wood gathering is not a significant recreational pursuit in this area. However, dispersed recreation opportunities are moderate. Some hiking and hunting activities occur in this portion of the Webster Range. The area is known for excellent elk and deer hunting. Limited fishing opportunities exist in Sage Creek and Deer Creek. Good fishing exists in Crow Creek. Dispersed recreation opportunities such as hunting, firewood gathering, and sight seeing make up most of the use. Other uses such as huckleberry picking, camping, ATV use, and winter sports are also primary uses.

Dispersed use areas within the Dairy Syncline Tract study area are Huckleberry Basin, Green Basin, Wolf Mountain, Slug Creek, and Dry Canyon.

A groomed snowmobile trail begins at a warming hut located by the Mill Fork Road near Trail Creek. The groomed trail is located along Slug Creek traversing south of Harrington Peak and past Big Basin and continuing west of Huckleberry Basin and Wolf Mountain where it returns to the warming hut.

Some use in the Dairy Syncline Tract occurs as fall hunting, firewood gathering and winter snowmobiling (USDA Forest Service, 1992a). Other recreational uses that occur near the Dairy Syncline area are ATV use and big game hunting. Hunting activity within Big Game Unit 76, of which this tract is a part, has the second highest number of hunters in the state. It is considered the number one area in the state for big game archery hunting. The area is also number one in the state for moose harvest density (USDA Forest Service, 1989, pg. 4-9).

Trails There are ten trails in the study area. The trails are within the Manning Creek portion of the study area providing access to recreation use areas. Most trails, at this time, are used by grazing permittees, hunters, ATV's and motorcycles, hikers and fishermen (see Figure 3-26).

Manning Creek Trails

- 091 Sage Creek
- 092 South Fork Sage Creek
- 093 Deer Creek
- 102 North Fork Deer Creek
- 401 Panther Springs
- 402 Manning Basin
- 403 Pinnacle Peak
- 404 Well Park
- 405 Sage Valley
- 406 Sage Meadows

WILDLIFE RESOURCES

This section describes the existing environment as it relates to Issues 3 and 4.

Issue 3 - The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on wildlife and wildlife habitats including old growth vegetation.

Issue 4 - The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on wetlands, riparian areas, water quality, and fisheries in the Salt and Blackfoot River drainages.

Introduction

This section documents the existing environment and wildlife habitat resource conditions and provides the baseline from which to evaluate and compare alternatives and to document resource conditions for potential future mine/reclamation activities should leasing and subsequent mining be allowed on one or both of the proposed lease tracts.

Overview of Analysis Areas

The Caribou National Forest and Curlew National Grassland supports or contains potential habitat for approximately 350 vertebrate wildlife species, including 63 mammalian species, 248 birds, 16 fish, 16 reptiles, and 7 amphibians (USDA Forest Service, 1995a, Appendix F). The Forest is widely known for its quality big game hunting for Rocky Mountain elk, mule deer, and moose, and the diversity of wildlife species that inhabit southeast Idaho.

The Manning Creek and Dairy Syncline Tracts provide suitable habitat for a variety of birds, mammals, reptiles, and amphibians. Both areas contain diverse plant communities including conifer, mixed conifer, aspen, mountain brush, and sagebrush-grass (see Figure 3-12 and 3-13). The Manning Creek Tract is relatively unroaded and contains wildlife habitat that has not been significantly disturbed. Timber harvest (planned), mineral exploration, and livestock grazing are the primary management activities within the area. The Dairy Syncline Tract is roaded and exhibits many characteristics of human activities including openings created by logging, mineral exploration, woodcutting, dispersed camping, and livestock grazing.

Both of the lease tracts are contained within the Idaho Department of Fish and Game (IDFG) Big Game Management Unit 76 which is generally managed to maintain high bull to cow elk and buck to doe mule deer ratios and a large component of mature bulls and bucks. Providing quality bull elk and mule deer buck hunting opportunities is one of the IDFG's management objectives for this area. The unit contains stable populations of elk, deer, and moose. Black bear also occur within this unit, although populations are considered low.

Manning Creek Tract

The Manning Creek area is located in the Crow Creek Management Area of the Forest Plan which provides good to excellent big game summer range with limited winter range and calving and fawning habitat within the tract itself. Approximately 150 elk are thought to winter and calve within the area. Areas adjacent to the tract in the Crow Creek and Sage Valley areas to the east are considered big game winter ranges. Between 1,000 and 1,500 deer winter in the Crow Creek Management Area and on adjacent private lands (USDA Forest Service, 1985b, pg. IV-85).

Upland game birds in the Manning Creek area include ruffed and blue grouse. Waterfowl are common on the beaver ponds and riparian areas, particularly along Deer Creek and Crow Creek. Canada geese nest and are commonly seen on private lands along Crow Creek (Feltis, 1995).

The area also provides suitable habitat for individual species identified as endangered, threatened, or sensitive (Forest Service Intermountain Region). Also see section on Proposed, Endangered, Threatened, and Intermountain Region Sensitive (PETS) Wildlife Species later in this section. The U.S. Fish and Wildlife Service has reported a probable gray wolf sighting two miles south of the Manning Creek Tract in June, 1985. Northern bald eagles are regularly sighted along Crow Creek during Winter, two miles east of the tract. Crow Creek and Sage Valley are identified as bald eagle hunting and feeding areas. A peregrine falcon was observed on private land along Crow Creek in September, 1976. A single sighting of an adult peregrine falcon was recorded within this same area during spring, 1995 surveys along Crow Creek about 4 miles northeast of the tract. A peregrine falcon hawk site was established several years ago on the Gray's Lake National Wildlife Refuge (about 25 miles northwest), but no known active eyries exist on the Caribou National Forest.

Northern goshawks have been sighted immediately north of the area and are thought to nest in the vicinity. In addition, habitat for other wildlife species of concern dependant on wetland habitat including sandhill cranes, whooping cranes, and trumpeter swans utilize lower Crow Creek (about 8 to 10 miles east of Manning Creek Tract) and the Salt River in Star Valley (western Wyoming) during winter and early spring.

Dairy Syncline Tract

The Dairy Syncline Tract is located in the Blackfoot Management Area of the Forest Plan. The tract contains big game summer and transitional range, a limited amount of big game winter range, and approximately 3,000 acres of elk calving and deer fawning habitat. The Dry Valley and Slug Creek areas are important calving and fawning areas on the Caribou National Forest. The area also contains a major deer migration corridor in the central and southern portions of the tract. Mule deer winter range is generally west and south of this area on adjacent non-Forest system lands. The Dairy Syncline area also provides moose habitat, particularly in the Slug Creek corridor.

Large portions of the Blackfoot Management Area are considered relatively developed with about 25 percent of the area within 1/2 mile of a road, 75 percent of the area 1/2 to 3 miles from a road, and only 465 acres (less than 1 percent) more than 3 miles from a road (USDA Forest Service, 1985b, pp. IV-133). Roads are defined as vehicle routes that have been improved and maintained by mechanical means to ensure relatively regular and continuous use. A route maintained strictly by the passage of vehicles does not constitute a road. The Dairy Syncline Tract and adjacent areas (area encompassing Dry Basin and areas west to Big Basin) contain about 63 miles of existing road. Primary access into this area is the Slug Creek road system and the Harrington Peak Road.

The Dairy Syncline area contains suitable habitat for a few PETS wildlife species. Goshawks have been known to nest in the area, although known nest sites have not been active since 1991. Limited sage grouse populations exist in the Slug Creek corridor. Monitoring efforts of the IDFG have resulted in observations of a sage grouse lek about 2 miles north of the Dairy Syncline Tract. In addition, the area contains limited suitable peregrine falcon nesting habitat.

Wildlife Resources and Existing Habitat Conditions

The Manning Creek and Dairy Syncline Tracts contain various levels of habitat quantity and quality and generally support a wide variety of wildlife species. Both tracts contain a diverse arrangement of forest successional stages and plant communities. Human influence on the Manning Creek Tract is minimal and large portions of the area are relatively difficult to access providing high levels of solitude and security for wildlife. Terrain is generally steep and rough with small and large benches distributed throughout. The Dairy Syncline area has been logged

and roaded and is readily accessible by motorized vehicles. Terrain ranges from gentle valleys in the Slug Creek corridor and Green Basin areas to rolling hills and moderately steep, shallow canyons in the northern portion of the tract and near Harrington Peak.

The following describes existing wildlife habitat and resources that occur in the Manning Creek and Dairy Syncline Tracts. An evaluation of a variety of wildlife habitat features is provided along with an analysis of management indicator species and PETS wildlife species that would potentially be affected by phosphate leasing and subsequent mine development.

Wildlife Species

The following wildlife species are known or suspected to inhabit the study areas. The list has been compiled from existing information/species lists, personal communications with biologists knowledgeable of the flora and fauna of the areas, and observation or sign identified during field surveys. Fish species are discussed in the Fisheries/Watershed section.

Game Species: Rocky mountain elk, mule deer, Shiras moose, black bear, mountain lion, snowshoe hare, cottontail rabbit (two species), ruffed grouse, and blue grouse.

Mammals: Coyote, bobcat, badger, yellow bellied marmot, Uinta ground squirrel, red squirrel, yellow pine chipmunk, least chipmunk, blacktail and whitetail jackrabbit, northern pocket gopher, vagrant shrew, dusky shrew, montane vole, Ord's kangaroo rat, deer mouse, western harvest mouse, house mouse, bushy-tailed wood rat, striped skunk, raccoon, ermine, long-tailed weasel, porcupine, muskrat, beaver, and bats (unknown species).

Amphibians and Reptiles: sagebrush lizard, gopher and garter snakes, western chorus and leopard frogs, western toad, and tiger salamander.

Raptors: Bald eagle, golden eagle, red-tailed hawk, sharp-shinned hawk, ferruginous hawk, Cooper's hawk, goshawk, kestrel, Swainson's hawk, rough-legged hawk, great gray owl, flammulated owl, and boreal owl.

Primary Cavity Excavators: Northern three-toed woodpecker, hairy woodpecker, common flicker, and red-naped sapsucker.

Secondary Cavity Nesters: Red-breasted nuthatch, mountain chickadee, black-capped chickadee, mountain bluebird, and Clark's nutcracker

Other Songbirds: Common raven, gray jay, American robin, Stellar's jay, golden-crowned kinglet, rosy finch, Audubon's warbler, Oregon junco, Cassin's finch, western tanager, Hammond's flycatcher, chipping sparrow, eastern and western kingbird, horned lark, black-billed magpie, sage thrasher, western bluebird, western meadowlark, goldfinch, savannah, vesper, lark, sage and

Brewer's sparrows, varied thrush, red crossbill, pine siskin, winter wren, evening grosbeak, yellow-rumped warbler, olive-sided flycatcher, kingfisher, dipper, and hummingbird species.

Management Indicator Species

A Management Indicator Species (MIS) is, "A species selected because its welfare is presumed to be an indicator of the welfare of other species using the same habitat". [It is] a species whose condition can be used to assess the impacts of management actions on a particular area. The following are the wildlife MIS for the Caribou National Forest and Curlew National Grassland (USDA Forest Service, 1985a, pg. III-24), associated habitat types, and rationale for selection. Fish and other selected salmonid MIS are considered in the Fisheries/Watershed sections of this chapter. Additional discussion of each MIS, habitat requirements, and existing habitat condition is provided in the following sections. Several MIS are described in the T&E portion of this section (see Table 3-2).

Table 3-2 Forest Plan Management Indicator Species

| MIS Species | Associated Habitat Types | Rationale for Selection |
|---------------------------------------|---|---|
| Elk and Mule Deer | Early forest succession (aspen, Douglas-fir, lodgepole, other conifer, mountain brush, sagebrush-grass) | Economically and socially important, easily monitored; occur on all or most management areas on the Forest. If their habitat requirements are adequately met, adequate horizontal and vertical habitat diversity will be provided for most other wildlife species inhabiting the Forest |
| Hairy Woodpecker | Snags (old or decadent conifer and aspen) | Special habitat needs: cavity nester. Serves as an indicator of snags (decadent or dead conifer and aspen) |
| Yellow-bellied or Red-naped Sapsucker | Aspen and riparian | Special habitat needs: nest primarily in living, mature aspen in association with riparian zones |
| Sage Grouse | Sage-grass | Economically and socially important, have special habitat needs. Dependent upon successional stages of sagebrush for wintering and nesting habitat, as well as forbs for summer and brood-rearing. |
| Goshawk | Old growth (Douglas-fir, mixed conifer, and aspen) | Special habitat needs: nest primarily in old growth conifer, thus serve as an indicator in providing sufficient old growth for other wildlife dependent upon this habitat |
| PETS Species | See PETS section | Various habitat needs |

Rocky mountain elk, mule deer, goshawk, hairy woodpecker, and yellow-bellied sapsucker are known to occur in one or both of the tracts and in adjacent areas. Suitable habitat for sage grouse has also been identified in the Dairy Syncline Tract. With the exception of mule deer, elk, and limited information on goshawk, there is currently no baseline population data for MIS within the proposed lease tracts. Habitat requirements, life history information, and habitat suitability are described below.

Rocky Mountain Elk and Mule Deer

Elk and deer are economically and socially important and occur on all or most management areas on the Caribou National Forest. Idaho's mule deer attract the highest number of hunters followed by elk. Moose and black bear are also important big game species. Although early records tend to be conflicting, it is generally agreed that elk and mule deer populations were smaller in the early 1900's than exist today in southeastern Idaho. Since the turn of the century, elk and deer numbers have increased, although small fluctuations in total numbers have occurred.

Mule deer are more widely distributed throughout the Manning Creek and Dairy Syncline areas than elk. Both species range throughout the coniferous-aspen and mountain brush vegetative types during the summer months. Both areas are classified as big game summer range. The lower elevations of the Manning Creek area along Crow Creek provide mule deer winter range. Summer range population estimates were approximately six deer and about two elk per square mile in the general vicinity of the tracts in the early 1980s (Cooperative Wildlife-Idaho Department of Fish and Game, 1984 & 1985, Phase II).

Elk and deer habitat selection is conditioned by topography, weather, biological factors of forage and cover, and escape from predators and recreationists (Thomas and Toweill, 1982). If habitat requirements are adequately met for elk and deer, horizontal and vertical habitat diversity would be provided for most other wildlife species inhabiting the forest (USDA Forest Service, 1985b, III-24). Optimum deer and elk habitat is the amount and arrangement of cover and forage areas that result in the maximum possible use of the maximum possible area by elk and deer. The ratio of 40 percent cover to 60 percent forage of proper size and arrangement approximates optimum elk and deer habitat (Thomas, 1979). The interspersed cover and forage affects the quality of habitat and the overall use of available resources. As a general rule, elk and deer prefer the edge or ecotone between cover and forage areas. If blocks of cover or forage areas become too large, use of the central portion of the habitat decreases. These areas, particularly large forage areas lacking cover habitat, effectively become low use areas.

Quality big game habitat contains security areas that provide abundant hiding cover with few open roads where big game animals can find refuge from disturbance and harassment. The effectiveness of elk and deer in obtaining optimum use of the maximum area is adversely influenced by the presence of roads that are open to vehicular traffic (Leege, 1976; Thiessen,

1976; Perry and Overly, 1976). Researchers have reported decreased big game use of areas adjacent to roads for distances ranging from 0.25 to 0.50 miles (Perry and Overly, 1976).

Elk and deer also require available water, particularly on summer range. Studies conducted by Marcum (1975, 1976) in Montana indicate that elk make disproportionately heavier use of areas within 1,050 feet of water. Julander (1966) documented similar patterns for mule deer. Optimum deer habitat is usually within 0.5 miles of a water source (Mackie, 1970).

Elk and Deer Habitat Effectiveness

An elk habitat effectiveness model developed by Thomas et. al., (1988) was used to evaluate existing big game summer range habitat conditions in the Manning Creek and Dairy Syncline areas and the potential habitat alterations that would occur during mine development should the tracts be leased. The model is a tool that can be used to evaluate and describe multiple habitat variables and the effectiveness of an area in its ability to support elk and deer. Previous work notes that if habitat requirements for elk are provided, the habitat needs of deer would be more than met. For example, deer can use smaller cover patches than elk because their social groups are smaller. If a given area contains cover patches of sufficient size to provide thermal cover for elk, the needs of deer for thermal cover should also be met. Thus the elk habitat effectiveness model can be used to evaluate both elk and deer habitat. The model, however, has limitations and does not necessarily produce absolute values regarding habitat conditions or changes. Rather, the model is a useful analytical tool to compare and analyze the relative differences between alternative management options.

A formal analysis using three primary habitat variables was completed for two separate evaluation areas encompassing the Dairy Syncline and Manning Creek Tracts. Variables include: 1) cover quality (HEc) which was determined by delineating the amount of satisfactory thermal cover (greater than 70 percent canopy closure) and marginal thermal cover (40-70 percent canopy closure) and calculating the relative proportion of each cover type. Each proportion was then weighted (satisfactory thermal cover is 100 percent effective; marginal cover is 10 percent effective on big game summer range) and the product of the two values subtracted from 100 determines the (HEc); 2) size and spacing (distribution) of cover and forage habitats in relation to one another (HEs) which is derived by determining the amount of area deficient in cover or forage habitats using 1,200 feet as the distance in which a given cover or forage block remains effective for big game use; and 3) open road densities (HEr) which were determined by calculating the number of miles of road within the evaluation areas per square mile of habitat. The Habitat Effectiveness Index (HEI) is the geometric mean (e.g., $HEI = (HEc \times HEs \times HEr)^{1/3}$) of the three habitat variables measured. Habitat effectiveness values are presented on a scale of 0.0 to 1.0 with a score of 1.0 being the highest and 0.0 being the lowest. Values of 0.50 are considered moderate in terms of big game habitat effectiveness.

In addition, other habitat parameters also were evaluated including the percentage of the areas that provide high quality thermal cover and the ratio of cover and forage habitats within the study areas. The model was designed to evaluate changes to elk habitat resulting from management activities that alter the above elk and deer habitat parameters.

The model is based on the following assumptions which have been developed from studies conducted on elk and deer habitat use and behavior. Research suggests that: 1) elk and deer make the most use of forage areas within 600 feet of cover. This allows them to escape to cover quickly and conserve energy; 2) use of cover habitats generally decreases in areas greater than 1,200 feet from an edge; 3) elk and deer use areas near the immediate boundary between openings and cover less than they use the central areas of either. Some studies suggest that this may be partially due to forage plants being less nutritious because of shading and competition for available nutrients and moisture. Vegetation along the forested edges also may not provide adequate thermal or escape cover; and 4) the density and type of roads and the amount of vehicular use in an area has a direct effect on how and when elk and deer utilize habitat. Disturbance and harassment from road use has been shown to increase the metabolic rate of big game animals and consumption of energy resources (Geist, 1978).

A detailed description of the habitat parameters model in which the attributes included in the evaluation and the assumptions made in the modeling effort are contained in the Wildlife Resource Background Report. Detailed maps (1:24,000) have been prepared which delineate existing cover and forage habitat in each of the big game evaluation areas. These maps are included in the analysis file. Figures 3-6 and 3-7 illustrate the location of the evaluation areas and a generalized representation of the existing arrangement of cover and forage within each area. Table 3-3 presents the results of the habitat evaluation which is followed by a description and analysis of the model outputs and existing condition of elk and deer habitat within the evaluation areas.

Table 3-3 Habitat Effectiveness - Existing Big Game Habitat Conditions

| EVALUATION | HABITAT PARAMETERS | | | | | |
|--|--------------------|---|---------------------------|---|-------------------------------|--------------|
| | Cover/ Forage | Percent Area Satisfactory Thermal Cover | Cover Quality (HEc) | Size and Spacing of Cover and Forage (HEs) | Open Road Density (HEr) | Total HEI |
| Manning Creek Evaluation Area (21,716 gross acres) | 57.7:42. 3 | 24 % | 0.470 | 0.915 | 0.570 | 0.628 |
| Dairy Syncline Evaluation Area (17,640 gross acres) | 59.9:40. 1 | 16.6% | 0.349 | 0.925 | 0.500 | 0.544 |

Manning Creek Tract - The Manning Creek Tract and adjacent areas provide quality big game summer range with an abundance of cover, forage, and water. In addition, elk and deer winter range is located within and adjacent to the tract in the North Fork Deer Creek and Deer Creek drainages. A small amount of winter range is also located along the south-facing slopes along the upper reaches of Manning Creek. The northern portion of the tract also contains calving and fawning areas. The area is relatively unroaded and currently contains a large block of habitat that provides valuable security/escape cover for elk, deer, moose, and black bear.

Intermediate and early winter range is usually associated with the mountain brush vegetation type which is located primarily in the North Fork Deer Creek and Deer Creek drainages and in the lower elevations of the area. Late season wintering areas are usually in the sagebrush-grass vegetation type. Heavy snow can concentrate wintering big game in open, west facing side slopes and exposed ridges with access to cover. These conditions are generally lacking within the lease tract but are found immediately to the east on east and south-facing slopes of Crow Creek.

The quantity, arrangement, and distribution of cover and forage habitats is considered near optimum with a higher percentage of cover habitat. The cover to forage ratio is 57.7:42.3. Forage habitat is abundant with good to excellent quality. Some competition between sheep, elk, and deer for forage resources may occur within the area, although the level of competition has not been quantified. Primary forage habitat is provided by aspen, sagebrush-grass, and mountain brush vegetation types. Field reconnaissance in the area during fall, 1994 indicated that range and forage conditions appear to be good.

Satisfactory thermal cover in the Manning Creek Tract and adjacent areas is limited to north and east-facing slopes of the major drainages (Deer Creek, North Fork Deer Creek, Manning Creek, and Sage Creek). A large proportion of the area provides aspen habitat types with a much smaller component of conifer, mountain brush, and sagebrush-grass habitats. The measured Habitat Effectiveness for cover quality (HEC) is moderate at 0.47 with a fair representation of high elevation conifer stands distributed throughout the area. Hiding cover is considered relatively abundant in the evaluation area. Size and spacing of cover and forage habitats is considered good in the area due to the inherent mosaic pattern and variety of vegetation types. Open road density is relatively low in the evaluation area. Most of the area is very difficult to access because of the absence of roads and rough topography. Access into the area is provided primarily by trails. Overall habitat effectiveness for the evaluation areas is considered good at 0.628.

Calving and Fawning Habitat - Known calving and fawning areas are found in small pockets in the Manning Creek Tract. Approximately 925 acres located in the northern and central portions of the tract are considered potential calving and fawning habitat. However, because the tract is located at a relatively high elevation, snow depths during the calving and fawning season during any given year may preclude calving and fawning use. Calving and fawning habitat within the area is depicted in Figure 3-8.

Winter Range and Migration Routes - Elk and mule deer tend to use the same wintering areas year after year. Thus, well developed migration routes have been established and tend to be used even if partially blocked. The Manning Creek Tract contains primarily big game summer range because of its high elevation, although small parcels of big game wintering areas have been identified within the tract. In addition, a mule deer wintering area is located immediately east of the tract on the east-facing slope along Crow Creek. Approximately 500 acres of big game winter range is identified within the Manning Creek Tract, primarily in the North Fork Deer Creek and Deer Creek drainages (see Figure 3-8). No major migration routes have been identified within the Manning Creek Tract.

Dairy Syncline Tract - This tract also contains primarily big game summer range. Water resources are available in Big Basin, Green Basin, and the Slug Creek corridor. Several springs are also available within the tract along small tributaries. Some big game winter range, a relatively large calving area, and major deer migration routes are found within the area.

The cover to forage ratio in this area is considered good at 59.9:40.1. Current conditions of cover habitat and the availability of high quality forage appears to be about optimum, although portions of the area where timber harvest has occurred has resulted in a few relatively large cover deficient areas. In addition, cover deficient areas have been identified in naturally occurring meadows along the periphery of the evaluation area in the Slug Creek corridor. A large proportion of the available cover in the northern end of the area provides satisfactory thermal cover comprised primarily of conifer stands with a mixture of aspen. The southern half of the area is predominantly aspen with interspersed conifer stands on the north and east-facing slopes of drainages. In general, satisfactory thermal cover is relatively limited in the southern portion of the area. Overall, this area contains about 16.6 percent satisfactory thermal cover. Habitat effectiveness for cover quality is considered fair. Size and spacing of cover and forage is considered good within this area. Road densities in the Dairy Syncline evaluation area contributes to a moderate Habitat Effectiveness rating for road density. Access into this area is relatively easy and is likely contributing to a high level of harassment and vulnerability prior to and during big game hunting seasons. The concerns, however, are not only associated with hunting seasons. Calving and fawning season is a critical time period where excessive human intrusion and activities would cause stress and move animals from their traditional calving/fawning grounds. Big game habitat effectiveness in the Dairy Syncline area is moderate at 0.544.

Calving and Fawning Habitat - Most of the Dairy Syncline Tract is considered high value calving and fawning habitat. Approximately 2,850 acres have been delineated in the Forest GIS system (see Figure 3-9). About 80 acres near Wilde Canyon are considered very high value calving and fawning habitat.

Winter Range and Migration Routes - Winter range in this portion of the Forest is generally located west of the Dairy Syncline area, although small, isolated ridges are identified in the Forest Plan as elk winter range (See Figure 3-9). In an extensive winter range survey conducted by the IDFG in 1982-1983, approximately 227 mule deer were counted between Sulphur Canyon and

Georgetown. Deer populations have probably increased since these winter range studies were conducted. Primary elk winter range is located in the Dry Basin approximately 3 miles east of the Dairy Syncline Tract. The Dairy Syncline area also contains a major mule deer migration corridor through the southern one-half of the lease tract (See Figure 3-9). This migration corridor is considered very important for deer moving between traditional summer and winter ranges.

Elk and Deer Management, Population Trends, and Hunting Opportunities

Both the Manning Creek and Dairy Syncline Tracts are contained entirely within the IDFG's Front Range Big Game Management Unit 76. This unit, as well as other Front Range units, is generally characterized as some of the most productive big game habitat in Idaho. Deer populations are known to fluctuate considerably because of severe winter conditions (heavy snow accumulations and prolonged sub-zero temperatures). Winter surveys conducted by the IDFG have shown significant numbers of elk wintering in the region. Population estimates indicate that approximately two elk and about 6 deer per square mile occur within the general vicinities of the lease tracts during summer months (Cooperative Wildlife-Phosphate Study, Phase 2, 1984). These densities have probably increased since the late 1970s and early 1980s due to increasing populations, particularly for elk.

The Idaho Elk and Mule Deer Management Plans (1991-1995) provide the department's overall desired future conditions and general management direction for management of big game in this area. Limited entry elk hunts were established during the 1994 season to increase the survival of mature bulls in the area; in 1994 and 1995 the IDFG limited the number of out-of-state rifle mule deer tags in order to control hunter density within the unit.

Table 3-4 illustrates the relationship between current Rocky Mountain elk, mule deer, moose, black bear, and mountain lion population/harvest parameters and goals and objectives for Unit 76. Additional information and statistics on all big game hunting data collected from the IDFG (Compton, 1995) for Unit 76 is contained in Appendix 1 of the Wildlife Resource Background Report. The data includes the number of permits, harvest level, hunter success, days/hunter, and information on big game tag lottery drawings.

**Table 3-4 IDFG Big Game Management Objectives -
Southeast Idaho Big Game Management Unit 76**

| Criteria | Goal | Status |
|--|-----------|---|
| Rocky Mountain Elk | | |
| Post-Season Bull:Cow | > 20:100 | 35:100 (1993) |
| % Branched Antlered | > 50 | 58 (1993) |
| % Yearlings in Harvest | <35 | *76-1 = 24 *76-2 = 50 *76-3 = 27 1993 Data |
| % Six-Point Bulls in Harvest | >20% | *76-1 = 10 *76-2 = 13 *76-3 = 23 1993 Data |
| Mule Deer | | |
| Population Level | Maintain | Reduced |
| Mature Buck Numbers | Increase | Reduced |
| Moose | | |
| Population Level | Increase | Believed Stable |
| Black Bear** | | |
| % Females in Harvest | ≤ 35 | 41 1991-93 Data |
| Median Age of Males | ≥ 4 | 3.0 1991-93 Data |
| Median Age of Females | ≥ 6 | 3.7 1991-93 Data |
| Mountain Lion** | | |
| Harvest | Stabilize | Stable |
| % Females in Harvest | Reduce | Reduced |
| <p>* Unit 76 is further segregated by the IDFG into units 76-1, 76-2, and 76-3 for managing big game permits and specific hunts (i.e., bull hunts, cow hunts etc.) in specific geographical areas of unit 76. The Manning Creek and Dairy Syncline Tracts are contained within unit 76-2. Detailed descriptions of hunt unit boundaries are contained in the Idaho Fish and Game Big Game Rules.</p> <p>** Black bear and mountain lion are managed on a Data Analysis Unit basis, which includes more than one Game Management Unit</p> | | |

Rocky Mountain Elk Management Objectives and Considerations - Overall, elk populations in Unit 76 are thought to be stable. Table 3-5 illustrates estimated elk population parameters (with 90 percent confidence interval) for Unit 76 obtained from aerial surveys (Compton, 1995).

The Rocky Mountain elk population goal of the IDFG for Unit 76 is to maintain current population levels. Management objectives for elk in this unit include: 1) maintaining the post-season bull to cow ratio of more than 20:100 (20 bulls per 100 cows) with 50 percent of the bull population being branch-antlered; and 2) maintain the percentage of yearling bulls in the antlered segment of the harvest at or below 35 percent and the percentage of mature bulls (having at least six points on one antler) at or above 20 percent.

Table 3-5 Estimated Rocky Mountain Elk Populations for Unit 76

| Rocky Mountain Elk Population Parameter | Year | |
|--|-----------------|-------------------|
| | 1992 | 1995 |
| Cows | 1,192 \pm 241 | 1,453 \pm 532 |
| Calves | 714 \pm 152 | 709 \pm 251 |
| Yearling Bulls | 200 \pm 53 | 216 \pm 71 |
| Sub-adult Bulls | 71 \pm 41 | 222 \pm 117 |
| Adult Bulls | 173 \pm 78 | 75 \pm 37 |
| Unclassified | 304 \pm 207 | 539 \pm 791 |
| Total | 2,654 \pm 415 | 3,213 \pm 1,072 |
| Calves/100 Cows | 60 \pm 18 | 49 \pm 23 |
| Bulls/100 Cows | 37 \pm 13 | 35 \pm 20 |
| % Adult Bulls | 7 \pm 3 | 2 \pm 1 |

The IDFG has received recent complaints from local farmers in this unit regarding depredation on alfalfa fields in Sulphur Canyon approximately 7 miles west of the Dairy Syncline Tract. Similar reports have been received on elk damage near Georgetown approximately 8 miles south of the Dairy Syncline Tract. Because of increasing elk populations, an increase in the number of antlerless hunting permits are expected to be issued to slightly reduce the wintering population.

Mule Deer Management Objectives and Considerations - Mule deer populations are generally thought to be stable in this management unit. The estimated buck to doe ratio is 33:100. The numbers of fawns per 100 does is estimated at 45:100. Table 3-6 illustrates estimated general season mule deer harvest for Unit 76 from 1990 through 1993.

Table 3-6 Estimated General Mule Deer Harvest for Unit 76 (1990 - 1993)

| Parameter Measured | Hunting Season | | | |
|---------------------------------|----------------|--------|--------|--------|
| | 1990 | 1991 | 1992 | 1993 |
| # Hunters | 7,135 | 7,090 | 6,363 | 4,954 |
| # Hunter Days | 38,886 | 36,514 | 40,660 | 35,990 |
| % Hunter Success | 57 | 57 | 50 | 23 |
| # Male Mule Deer Harvested | 2,831 | 2,623 | 2,480 | 785 |
| # Female Mule Deer Harvested | 1,213 | 1,413 | 700 | 354 |
| Total Mule Deer Harvested | 4,044 | 4,036 | 3,180 | 1,139 |

The IDFG population direction goal is to maintain current populations. Management objectives for mule deer in the Front Range (Group 4) units include: 1) maintain current mule deer population levels; 2) increase mature buck numbers; 3) provide opportunity for low hunter density/mature buck hunts; and 4) on a three-year average for the Front Range area, maintain at least 50 percent of the November controlled buck harvest in the four point plus category.

Applicable management considerations for mule deer in this unit include: 1) rapid population changes can occur in some units due to high productivity and/or winter mortality; 2) mature buck numbers are below desired levels; 3) populations in some eastern Idaho units are at or above biological or sociological carrying capacities; and 4) depredation on agricultural crops can be a problem, particularly at high deer densities or during severe weather conditions.

Elk and Mule Deer Hunting Seasons and Opportunities

In 1994, the IDFG limited non-resident mule deer hunting opportunities in the southeast Units (75, 76, 77, and 78) to 800 tags sold on a first come, first serve basis in order to reduce overcrowding and improve buck survival. Archery deer season remained unchanged from the past several seasons and is usually open from August 30 through September 24 for both antlered and antlerless deer. General deer season generally occurs from October 15 through October 25 for antlered deer and October 22 through October 23 for antlerless deer.

Also beginning in 1994, the IDFG limited Rocky Mountain elk hunting opportunities in Unit 76 in an attempt to improve hunter experience by reducing hunter density and to increase survival of branch antlered bull elk. Unit 76 was further subdivided from the three identified in Table 3-4 into four separate controlled hunt areas (76-1, 76-2, 76-3, and 76-4). In 1994, all hunts in this unit were controlled with tags allotted through a lottery drawing. An antlerless elk hunt occurred from November 25 through December 15 in Unit 76-1 with 75 total tags. In units 76-2, 76-3, and 76-4; 250, 200 and 200 (respectively) total either sex tags were allotted. This season occurred from October 1 through October 14. General archery elk season (antlered and antlerless) generally runs from August 30 through September 24.

Illegal Big Game Harvest/Poaching

Illegal harvest is considered a major problem in this portion of the Caribou National Forest and is thought to be related to the amount of development within the area (Cooperative Wildlife-Phosphate Study, Phase 2, 1984). The Dairy Syncline Tract is easily accessible by road which could contribute to illegal harvest. The Manning Tract contains few roads; illegal harvest within the tract is probably not as large a problem compared to areas with higher road densities.

Hairy Woodpecker

The hairy woodpecker reproduces in deciduous or coniferous forests, wooded swamps, orchards, woodlands, and well-wooded towns and parks which provide snag and log habitat for nesting, foraging, and roosting. Forage items include insects and sap from sapsucker holes. Other seasonal forage items include primarily nuts and possibly cached insects.

The hairy woodpecker was selected in the Forest Plan as a MIS due to special habitat needs and requirements. Hairy woodpeckers are thought to be dependent on snag and log habitat for nesting, foraging, and roosting. Suitable habitat is generally provided in mature and old or decadent conifer and aspen forest types.

Manning Creek Tract

Primary habitat for the hairy woodpecker within the Manning Creek area is contained on the north and east-facing slopes along several of the major drainages within the area. Aspen habitat capable of providing nesting and foraging substrate occurs on the north, east, and south facing slopes within the area. The Manning Creek Tract contains an estimated 1,400 acres of snag and log habitat which provides suitable hairy woodpecker nesting, roosting, and foraging habitat. Most of this habitat is provided by existing conifer and mixed conifer stands. Most of the aspen habitat within the area is of small diameter and is probably not suitable for nesting habitat.

Dairy Syncline Tract

The Dairy Syncline Tract provides over 2,400 acres of suitable hairy woodpecker habitat and includes conifer, mixed conifer, and aspen habitat types. The bulk of conifer habitat within the area is concentrated in the northern portion of the area. The central and southern portions of the tract contain a mixture of conifer, mixed conifer, and aspen stands.

Yellow-bellied/Red-Naped Sapsucker

Special habitat needs of the red-naped sapsucker in southeast Idaho include large diameter aspen in close proximity to water for nesting, roosting, and feeding. Nesting areas are generally used year after year with nest site selection usually in large diameter aspen or other poplar affected by heart-rot. The same nest tree is often used repeatedly, but a new cavity is excavated annually (Scott et. al., 1977). Diet includes sap from a variety of trees, cambium, fruit, berries and occasionally nuts. Immature birds are taught sapsucking soon after fledgling and are dependent upon parents for one to two more weeks. Sapsuckers are known to guard sap wells from other birds and mammals.

Manning Creek Tract

The Manning Creek area contains a perennial stream (Deer Creek and North Fork Deer Creek) and several springs with small to medium diameter aspen. Suitable habitat availability within this area is thought to be limited, although habitat quality and abundance has not been formally measured. It is estimated that this tract contains 450 to 500 acres of marginally suitable sapsucker habitat.

Dairy Syncline Tract

This tract contains numerous seeps and springs. Slug Creek is the primary perennial stream within the area. An estimated 1,100 to 1,200 acres of suitable sapsucker habitat has been identified that could be affected by potential activities.

Sage Grouse

Sage grouse are dependent on sagebrush-grassland communities for cover, forage, and reproductive habitat. Groups of males occupy leks from the months of April through May. Nest sites are generally located on the ground under sagebrush and in shallow depressions. Sage grouse forage on flowers and buds from forbs. Sagebrush leaves provide critical winter forage. These birds are thought to migrate locally during winters with heavy snow accumulation. Sage grouse have declined significantly throughout their historical range which is thought to be attributable to habitat loss resulting from agriculture, herbicide use, and grazing that has damaged or eliminated sagebrush and bunchgrass communities (Johnsgard, 1973).

Sage grouse are considered socially important in southeast Idaho and elsewhere within its historical range. Habitat for these birds is limited in both tracts, particularly in the Manning Creek Tract. Both the Manning Creek and Dairy Syncline Tracts are within the historical or suspected range of this species. The IDFG (IDFG, 1995) has reported observations of this species about 2 miles north of the Dairy Syncline Tract in the Slug Creek corridor. About 150 acres of suitable sage grouse habitat exists in the Dairy Syncline Tract. Wilde Flats and the Slug Creek corridor provide additional suitable habitat adjacent to the tract.

Other Big Game Species

Shiras Moose

Early historical records make little mention of moose in southeast Idaho. However, moose are believed to be indigenous to the area and are found scattered throughout the area. Moose prefer conifer-aspen, mountain brush, and riparian vegetation types. Moose habitat in the Manning

Creek Tract includes the North Fork Deer Creek, Deer Creek, and the South Fork Sage Creek drainages. Primary habitat in the Dairy Syncline area includes the riparian and adjacent upland habitats along Slug Creek.

Specific moose migration routes are not well documented in these areas. Moose seem to winter wherever suitable forage is available. During a 1973-1974 winter aerial survey, IDFG counted 50 moose in game management Unit 76. Both the Manning Creek and Dairy Syncline Tracts provide moose summer range. Moose are common in the Dairy Syncline area in the winter and Manning Creek area provides limited winter habitat. Surveys during February 1994 in the Dairy Syncline area indicated that moose were utilizing the Wilde Canyon area. Moose densities within these areas are estimated at about one moose per square mile (Cooperative Wildlife-Phosphate Study, Phase 2, 1984).

Moose hunting opportunities in southeast Idaho are provided on a limited basis. Unit 76 is managed under smaller subunits for moose hunting similar to those units described earlier for Rocky Mountain Elk. In Unit 376-1 (located north of the Manning Creek Tract in the Stump Creek area), an average of 27 antlered bull moose permits were issued yearly between 1984 and 1993. An average of 11 either sex permits were issued between 1984 through 1993 in Unit 376-2, and an average of 12 antlerless moose permits were issued in Unit 376-3 during the same period. Season lengths average 86 days and generally run from August 30 through November 23.

Black Bear

Black bears are also an important big game animal in Idaho. These large omnivorous have relatively small home ranges (5-15 square miles) and are primarily nocturnal. Black bears go into torpor (semi-hibernation) in winter. They forage in the spring through fall opportunistically on berries, nuts, tubers, insects and their larvae, eggs, honey, carrion, small mammals, elk, deer, and moose (primarily calves and fawns). Hibernation usually occurs beneath large trees, hollow logs, or caves where available. Old growth and mature conifer stands are thought to be key habitat for forage, loafing, and winter habitat, although early successional stages provide seasonal forage items.

The Manning Creek and Dairy Syncline Tracts support resident black bear populations, although populations in southeast Idaho are considered low. Huntatable populations exist and are increasing throughout Idaho. Black bear hunting and dog training opportunities exist in Big Game Unit 76. Spring bear season generally runs from mid-April through early June with the fall season occurring from mid-September through mid-October. Dog training season runs from early June through late-July. Black bear harvest for Unit 76 during 1986 through 1993 ranged from a high of 9 bears in 1988 to zero in 1990. The bulk of the recorded harvest has been comprised of male bears (Compton, 1995).

Mountain Lion

Mountain lions have large home ranges (10-40 square miles) and feed primarily on deer, although they are thought to be opportunistic, occasionally taking hares, rodents, and domestic livestock. Population density throughout this portion of southeast Idaho is thought to be relatively low. Suitable habitat within the Dairy Syncline area is probably limited due to the developed condition of the area. The Manning Creek Tract contains fair to good cougar habitat with seasonally abundant forage (concentrations of wintering mule deer in the Crow Creek corridor).

Limited mountain lion hunting opportunities are provided in several Idaho big game hunting units including Unit 76. The season usually runs from mid-September through late-February or until a specified female harvest quota is reached. Dog training opportunities are also provided in this unit after the harvest quota has been reached. If the quota is not met, the season generally runs from early-February through late-February. Mountain lion harvest in Unit 76 from 1986 through 1993 ranged from a high of 4 in 1988 to a low of a single animal in 1986, 1987, and 1991. The harvest has been split nearly evenly between males and females (Compton, 1995).

Upland Game Bird Species

Ruffed Grouse

Ruffed grouse utilize deciduous and coniferous forests with dense understories. Ruffed grouse are strongly associated with aspen vegetation types in southeast Idaho, foraging primarily on buds, leaves, flowers, seeds, and fruit. A smaller proportion of the diet is comprised of insects, spiders, snails, and small vertebrates. The young feed primarily on insects and other invertebrates. This grouse species is one of the most temperate-adapted of all North American grouse (Johnsgard, 1973). During severe weather conditions, ruffed grouse may resort to coniferous trees or to roosting beneath the snow. Under such conditions, ruffed grouse become extremely vulnerable to predation. Optimal activity centers (spring habitat) are thought to contain 40-50 year old stands of aspen within sight of a drumming log. Gullion and Marshall (1968) determined that the presence of aspen is the most important aspect of cover which regulates selection of activity centers and they found a strong relationship between cover types and male survival. In addition, many researchers believe that aspen buds are the principle food source for ruffed grouse with willow, alder, dogwood, clover, rosehip, and a variety of nuts, seeds, and fruits also providing nutritional value.

Ruffed grouse data for the two lease tracts is very limited (Lukens, 1995). No recent surveys (wing collections) have been initiated in this portion of the Caribou National Forest. Most monitoring activities have been focused in the past on Columbian sharp-tailed and sage grouse in other portions of southeast Idaho. No reliable information has been collected regarding population estimates, trends, and hunter harvest levels in these areas.

The Manning Creek Tract contains about 450 to 500 acres of aspen and aspen/conifer habitat while the Dairy Syncline Tract contains approximately 1,200 acres. The primary suitable habitat for ruffed grouse within the two proposed lease tracts is probably represented within these habitat types.

Blue Grouse

The geographical range of the blue grouse is closely associated with the distribution patterns of the true firs (*Abies*) and Douglas-fir (*Pseudotsuga menziesii*) in the western states (Johnsgard, 1973). This species occupies a fairly broad vertical range in the western mountains breeding at lower elevations (sometimes in the lower elevation foothills) and spending the fall and winter near timberline or even above it. Primary winter habitat for blue grouse includes sufficient trees to provide for roost sites, escape cover, and a supply of needles from true fir and/or Douglas-fir. Needles, buds, twigs, and seeds of Douglas-fir may all be utilized in the winter, and needles, buds, and pollen cones of true fir are also utilized when available. Spring habitat preferences appear to be timbered areas with small openings and large log habitat. Blue grouse utilize ridge tops near rock outcroppings for strutting grounds and forage areas.

Blue grouse habitat is available in both tracts. Key wintering habitat (an estimated 300 acres) occurs along the ridge between Green and Big Basin from Harrington Peak north through the western edge of the Dairy Syncline Tract. Key winter habitat within the Manning Creek area includes the south-facing ridge along Deer Creek. Population estimates are unavailable, but huntable populations occur within the areas. Approximately 1,200 acres of conifer and mixed conifer habitat (considered as suitable blue grouse habitat) occurs within the Dairy Syncline Tract with an estimated 900 acres in the Manning Creek Tract.

Sage Grouse

Sage grouse are dependent primarily on sagebrush-grassland communities for cover, forage, and reproductive habitat. Sagebrush leaves provide critical winter forage. Habitat for this species is limited within both lease tracts, although both areas are within the historic range of the sage grouse. Loss of sage brush habitat due to agriculture and ranching has reduced suitable habitat for this once plentiful species.

The Manning Creek and Dairy Syncline Tracts are not known to contain populations of sage grouse. Limited populations and leks have been documented in the Slug Creek drainage north of the Dairy Syncline Tract (Southeast Region Sharp-tailed and Sage Grouse Lek Data Base, IDFG, 1995). Wilde Flats and the Slug Creek drainage contain suitable sage grouse habitat.

Special and Unique Habitats

Unique habitats include cliffs, rock outcroppings, caves, talus, and wetland/riparian habitats. Riparian areas provide some of the most diverse and heavily used wildlife habitats in the coniferous forests of the west due to the presence of open water, succulent vegetation, forage, and dense security cover. Riparian habitats also provide travel and dispersal corridors for big game, small mammals, reptiles, and amphibians. These areas also contain prime foraging habitat for moose, roosting and foraging habitat for grouse, and a variety of other species. Unique habitat features such as cliffs, rock outcroppings, and riparian and wetland habitats are fragile environments and once destroyed, can seldom be restored artificially (Thomas, 1979). Special habitat features include artificially created habitats such as water source developments, nesting platforms, fences, etc.

The Manning Creek area contains talus slope (15 acres) in the north central portion of the tract along the small tributary to the South Fork Sage Creek in sections 13 and 14 and along Deer Creek about one-half mile downstream from the confluence of the North Fork Deer Creek. Several small rock outcroppings are also scattered within the tract. A rock outcrop/cliff complex is located adjacent to the tract in Section 35 along upper slopes of the south-facing ridge along Deer Creek. Riparian habitat in the Manning Creek area includes the South Fork Sage Creek, North Fork Deer Creek, and Deer Creek. The North Fork Deer Creek and Deer Creek contain very high quality riparian and wetland habitats with numerous beaver dams and large willow patches.

The Dairy Syncline area also contains special and unique habitat features, particularly in the northwest portion of the tract where a large cliff (approximately 1/4 mile in length with an estimated 100 foot vertical height) in Section 18 at 7,400 feet in elevation has been identified. The feature creates a sharp break between the relatively flat ridge top which is dominated with sagebrush-grass and mixed-conifer and the northeast-facing, heavily timbered slope to the east. Riparian habitats in the Dairy Syncline area occur primarily along Slug Creek. Several ponds, springs, and intermittent streams occur within the tract (see Figure 3-11). Ponds are located primarily in the Big Basin area, while springs are along and adjacent to streams.

Table 3-7, summarizes the special and unique wildlife habitat features that occur within the Manning Creek and Dairy Syncline areas. Additional information regarding special and unique habitat features is included in the vegetation, fisheries sections (riparian, wetlands, [Figures 3-14 and 3-15], plant communities), and range section (special features). Figures 3-10 and 3-11 illustrate the location of the unique habitat described above.

Table 3-7 Special and Unique Habitat Features

| Study Area | Perennial Streams | Intermittent Streams | Other Special and Unique Habitat Features |
|----------------------|--|---|---|
| Manning Creek Tract | South Fork Sage Creek, North Fork Deer Creek, Deer Creek | Manning Creek, Quakie Hollow, Unnamed tributaries | Talus slope, small rock outcroppings |
| Dairy Syncline Tract | Slug Creek | Wilde Canyon, Unnamed Tributaries | Cliff (northern portion of tract), ponds |

Raptor Nesting Habitat

A goshawk nesting area (inactive since 1991) has been documented within the Dairy Syncline Tract (Conservation Data Center, 1994 and Caribou National Forest records). Spring, 1995 field surveys confirmed that the known nesting structures were not active in 1995. An active Swainson's hawk nest site was identified in the Slug Creek corridor adjacent to the Dairy Syncline Tract during fall, 1995 surveys. Stick nests for unknown species have been documented approximately 2 miles north of the Manning Creek Tract. A suspected red-tailed nest territory occurs in the Deer Creek Corridor, but no nest site has been identified. No known nesting structures have been identified within the Manning Creek Tract.

An estimated 1,400 acres of suitable raptor nesting habitat exists in the Manning Creek Tract with about 2,400 acres in the Dairy Syncline Tract. These values represent the amount of all tree/timbered types in the area based on GIS vegetation layers.

Southeastern Idaho contains an abundance and diversity of birds of prey which rely on trees and other structures for nesting and roosting as well as a plentiful prey base which includes other birds for some species, small mammals, and carrion. Spring surveys of both the Manning Creek and Dairy Syncline areas indicated that the local raptor population is relatively high, particularly in the Slug Creek drainage.

No known active raptor nest sites have been identified in the Manning Creek Tract. However, several raptors including golden eagles, red-tailed hawks, Swainson's hawks, and sharp-shinned hawks were observed within and adjacent to the proposed lease tract. A single pair of suspected nesting red-tailed hawks were observed along Deer Creek on three separate occasions during spring, 1995 surveys in the Manning Creek area. The suspected nesting area along the north-facing slope of Deer Creek adjacent to the Manning Creek Tract was searched, but no nest structure was located.

Surveys of the Dairy Syncline area in the spring of 1995 resulted in the identification of an active Swainson's hawk nest in the Slug Creek corridor adjacent to the tract. A known goshawk nesting area was surveyed to determine whether they were active in 1995. No activity was observed in the Dairy Syncline area. No other nest structures were observed within the tract. The Dairy Syncline area is particularly rich in raptors due to the abundance of ground squirrels and other prey items.

Based on the number of raptors observed within both tracts, particularly the Dairy Syncline Tract, it is highly likely that additional searches for nesting raptors within and adjacent to the proposed tracts would reveal new or additional nest sites that were not initially discovered.

Snag and Log Habitat

Standing dead trees and down logs provide habitat for many species of invertebrates, birds, and mammals. Suitable nesting habitat is often considered the limiting factor for cavity nesting birds. There is a direct relation between the number of snags and the number of snag-dependent wildlife in the forest (Thomas, 1979). Log habitat is an important component of the forest ecosystem because of its role in nutrient cycling and nutrient immobilization. It also provides habitat for mycorrhizal fungi, invertebrates, and small mammals. Bull (1987) demonstrated that pileated woodpeckers in northeast Oregon preferred to forage on dead, down trees greater than 12 inches in diameter. Carpenter ants, which are the primary prey for pileated woodpeckers, typically occur in large diameter logs. Northern three-toed woodpeckers and flickers also utilize large diameter log habitat.

The Manning Creek and Dairy Syncline Tracts contain a mixture of conifer, mixed-conifer, aspen, mountain brush, and sagebrush-grass. The dominant vegetation type is mixed conifer and aspen. Snag and log habitat is provided primarily in conifer, mixed conifer, and aspen types. Although no efforts were made to directly measure the total numbers of snags and logs present on each acre within the tracts, transect surveys and visual estimates of snag and log habitat abundance indicate that those stands that have not been logged or affected by woodcutting contain a moderate to high level of snag and log habitat (average 2 to 4 snags per acre and 4 to 12 logs/acre). The amount of dead and down woody material in the tracts ranges from abundant to deficient and varies from stand to stand. Conifer and mixed-conifer stands contain medium to large (greater than 8-12 inch diameter) logs. Lodgepole pine stands were found to generally be snag deficient and contained medium to high levels of dead and down woody material with few large diameter logs (greater than 12 inches). Coniferous snag habitat availability is generally limited to north and east facing slopes and riparian areas. Aspen snag habitat is available on other slopes and riparian areas as well. Those portions of the Dairy Syncline Tract that have been logged are snag deficient within harvested stands. Snag habitat levels adjacent to roads are also limited due to woodcutting activity. An estimated 50 to 60 percent of the conifer-dominated stands within the Dairy Syncline Tract, are located in the northern portion of the area, although conifer stands are also located in the central and southern portions, particularly on north and east-facing slopes.

Old Growth Habitat

Old growth stands require 200 to 300 years to develop, and natural forces such as fire, insect infestation, and disease are important factors. Any disturbance within an old growth stand, including natural disturbances, that alter or change vegetative structure and condition can alter old growth characteristics, its function, and use in terms of wildlife habitat. Old growth stand conditions include mature and overmature trees in the overstory, decayed trees, witches brooms, standing dead trees and frequent windfalls. In addition, old growth habitat generally contains a multi-layered canopy with trees of several age classes and an abundance of snag and log habitat.

Revised old growth habitat definitions (Hamilton, 1993) were used to delineate old growth habitat within the tracts. The basis for individual stands to be delineated was a minimum 10 acre timber stand. Aerial photo interpretation and field surveys resulted in the identification of approximately 31 acres of old growth habitat was found in the proposed Manning Creek Tract and 22 acres within the proposed Dairy Syncline Tract (old growth is discussed in Chapter 3 Vegetation Section). Old growth acres were not found outside the lease tracts in areas where potential mine facilities could be located. Several of the conifer stands (primarily Douglas-fir) within the tracts contain characteristics that probably allow them to function as old growth habitat for wildlife but were not delineated due to their small size (less than 10 acres). Even though these stands do not meet the strict Forest Service definition for functional old growth, they do contain features such as mature trees, snags, and log habitat that are utilized by wildlife for feeding, nesting, and roosting. Old growth stands in both tracts are generally small and occur in clumps or patches. Old growth habitat in the Manning Creek Tract is located north of Manning Creek in the northern portion of the tract. Old growth stands in the Dairy Syncline area are located in the northern 1/3 of the tract. An estimated 1,400 and 2,400 acres of snag and log habitat occurs in the Manning Creek and Dairy Syncline Tracts, respectively.

Proposed, Endangered, Threatened, and Sensitive Wildlife Species (PETS)

The U.S. Fish and Wildlife Service list of threatened, endangered, candidate, and proposed species for the Caribou National Forest (Species List 1-4-96-SP-265, September 13, 1996), the Forest Service Intermountain Region Sensitive Species List, Idaho Conservation Data Center species sighting list (October 14, 1994), and Soda Springs and Montpelier Ranger District records were reviewed. Review of this information determined several wildlife species of concern, and/or their habitats are potentially present in the study area.

The following wildlife species of concern are evaluated in this analysis. Two separate documents would be prepared; a Biological Assessment (BA) for federally listed threatened and endangered wildlife species, and a Biological Evaluation (BE) for Intermountain Region wildlife sensitive species.

Listed Threatened or Endangered Wildlife Species

American Peregrine Falcon (*Falco peregrinus anatum*)

Northern Bald Eagle (*Haliaeetus leucocephalus*)

Gray Wolf (*Canis lupus*)

Whooping Crane (*Grus americanus*)

American Peregrine Falcon (*Falco peregrinus anatum*)

Suitable nesting habitat is known to exist in areas adjacent to both tracts. Field surveys of the tracts during Spring, 1995 resulted in the identification of suitable peregrine nesting habitat in the northwestern portion of the Dairy Syncline Tract. A large rock outcropping/cliff occurs within this area which is approximately 1/4 mile in length with an estimated vertical height of 100 feet or greater. However, no nest sites or peregrine falcons were observed within and adjacent to this tract. Potential feeding habitat also exists in these areas primarily near sagebrush-grass, mountain brush, grass/forest ecotones, and within larger wet meadow habitat complexes.

No suitable nesting habitat has been identified within the Manning Creek Tract, although suitable habitat exists in the Deer Creek drainage adjacent to the tract. No nest sites or peregrine falcons were observed during spring, 1995 surveys of the area. A single peregrine falcon was observed on private land along Crow Creek in September, 1976 several miles east of the Manning Creek Tract. An additional sighting of an adult peregrine falcon was recorded within this same area during spring, 1995 surveys. A suspected peregrine nest site was observed and reported to Forest and State biologists. No confirmation on nest status has been received to date. No additional sightings have been recorded in these areas recently. A hack site was established several years ago near the Gray's Lake National Wildlife Refuge approximately 25 miles north of the Dairy Syncline Tract. No known established nest sites exist on the Caribou National Forest.

Northern Bald Eagle (*Haliaeetus leucocephalus*)

Nesting habitat is lacking in the Manning Creek and Dairy Syncline Tracts. Foraging habitat is probably available in both tracts, primarily in the form of carrion that may be available during the winter and early spring seasons on big game winter ranges. Adjacent areas provide prey items in the form of fish and waterfowl. No known sightings have been recorded within either tract. Sightings along Crow Creek near the Manning Creek Tract are, however, recorded annually. This area is part of a mid-winter survey route which has resulted in several sightings each year. The east and south-facing slopes along the face of the Webster Range (0.25-2 miles west and adjacent to the Manning Creek Tract) could be utilized by wintering eagles for both foraging (carrion availability on mule deer winter range) and roosting habitat.

Winter, 1994/95 and spring, 1995, surveys of the area resulted in the observation of adult bald and golden eagles along Crow Creek downstream from the Manning Creek Tract. No eagles were observed in the vicinity of the Dairy Syncline Tract. Active nest sites in the general vicinity of the Manning Creek Tract include three nests on Palisades Reservoir and a nest site on Mill Creek near Thayne, Wyoming, on the Salt River. These nests are located approximately 36 and 20 miles north (respectively) of the Manning Creek area.

Gray Wolf (*Canis lupus*)

There has been one gray wolf sighting (probable) within the general vicinity of the Manning Creek Tract in June, 1985. The reported sighting occurred approximately two miles south of the tract. No additional investigated observations regarding the gray wolf have been recorded on the Caribou National Forest. No surveys specific to the gray wolf were conducted as part of this analysis. Limited winter tracking surveys during February, 1995 failed to locate any wolf tracks or vocalization of wolves within either the Manning Creek or Dairy Syncline Tracts. Both tracts are considered relatively developed and probably would not support sustainable populations of gray wolves. Of the two areas, the Manning Creek area would probably be the most likely to provide habitat capable of supporting this species. Habitat in the greater Yellowstone Ecosystem northeast of this area provides the primary remaining habitat for the gray wolf. Both tracts are within the Yellowstone non-essential population area for the gray wolf.

Whooping Crane (*Grus americana*)

One recorded whooping crane sighting was documented in the summer of 1985 approximately eight miles north of the Dairy Syncline Tract in the Lower Valley area near the Slug Creek Road. This area contains a relatively large wetland meadow complex and provides suitable habitat for several wetland-dependent species. Suitable habitat is also available in Star Valley approximately eight miles east of the Manning Creek Tract. Additional investigation is not warranted.

Intermountain Region Sensitive Wildlife Species

Further biological research and field study is needed to ascertain the status of the following taxa in this category:

Northern goshawk (*Accipiter gentilis*)

Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*)

Western big-eared bat (*Plecotus townsendii townsendii*)

Wolverine (*Gulo gulo luscus*)

Spotted frog (*Rana pretiosa*)

Trumpeter swan (*Cygnus buccinator*)

Harlequin duck (*Histrionicus histrionicus*)
Great gray owl (*Strix nebulosa*)
Flammulated owl (*Otus flammeolus*)
Boreal owl (*Aegolius funereus*)
Three-toed woodpecker (*Picoides tridactylus*)
North American lynx (*Felis lynx canadensis*)
Spotted bat (*Euderma maculatum*)

Northern Goshawk (*Accipiter gentilis*)

One known goshawk nesting area exists in the Dairy Syncline Tract. The nesting area was discovered in 1991 but has been inactive in successive years. No known nest sites occur within the Manning Creek Tract, although records indicate goshawk use of areas adjacent to the tract. Surveys conducted adjacent to the Manning Creek Tract in May-June 1992 and in August 1993 resulted in an observation of a familial group of goshawks, but no nest structure was located. No goshawk observations or vocalizations were recorded within the Manning Creek Tract during spring, 1995 transect and vocalization surveys.

Extensive surveys were conducted in suitable habitat in both tracts during the spring of 1995 including amplified calling and transect surveys. Two adult goshawks were observed in the Dairy Syncline Tract which were thought to be using a known goshawk nesting site within this area. However, transect surveys failed to locate any active nest sites. In addition, field inspection of the goshawk nesting area indicated the site was inactive during the 1995 nesting season.

Columbian Sharp-Tailed Grouse (*Tympanuchus phasianellus columbianus*)

The Wilde Flats area and Slug Creek drainage in the Dairy Syncline area contain limited suitable habitat for this species. Both the Slug Creek and Crow Creek drainages are within the suspected historical range of the sharp-tailed grouse. The IDFG (IDFG Southeast Region Sharp-tailed and Sage Grouse Lek Data Base, 1995) reports historical sharp-tailed grouse leks in the Dry Valley area approximately 7-8 miles northeast of the Dairy Syncline area, but observations of this species in this area has not been recorded since 1984. Limited field surveys were conducted for this species in conjunction with sage grouse surveys in the Manning Creek and Dairy Syncline areas. No sharp-tailed grouse sightings were recorded.

Western Big-Eared Bat (*Plecotus townsendii townsendii*)

There have been no observations in the Manning Creek and Dairy Syncline areas. Both tracts are within the suspected range of this species. Surveys have been completed in the past for the western big-eared bat on the Montpelier Ranger District which have determined presence of this

species on the District. Limited surveys to determine suitable habitat was completed as part of this analysis. However, no trapping was completed to determine presence or absence of the western big-eared bat within the tracts. Field surveys resulted in the identification of suitable roosting and foraging habitat within the tracts. The Dairy Syncline Tract contains stockwater ponds for foraging. In addition, Slug Creek provides foraging habitat. Potential roosting habitat is available in a rock outcrop/cliff complex in the northern portion of the tract. Suitable foraging habitat in the Manning Creek area includes the North Fork Deer Creek and Deer Creek drainage. Potential roosting habitat is also available in rock outcroppings located along the south-facing slope of Deer Creek. Conifer stands in both areas also provide suitable roosting and foraging habitat.

Wolverine (*Gulo gulo luscus*)

There have been no observations of this species within or adjacent to the tracts. No inventories or surveys have been completed in these areas. The Dairy Syncline Tract probably does not provide suitable habitat due primarily to development within the area (i.e., roads and logging); the Manning Creek area also provides limited habitat. Adjacent areas contain a moderate to low amount of development, although portions of these areas are fragmented. Limited winter tracking surveys were accomplished within both tracts during the winter of 1994/95. These surveys did not result in observations of wolverine tracks within either tract. Because of the level of development on these portions of the Caribou National Forest, wolverines are not thought to be present in these areas.

Spotted Frog (*Rana pretiosa*)

There have been no observations of this species within or adjacent to either tract. However, no surveys to locate this species have been conducted in the past on these portions of the Montpelier and Soda Springs Ranger Districts. The Manning Creek and Dairy Syncline areas are within the suspected range of this species. Perennial streams, springs, and wetland areas within and immediately adjacent to the tracts that contain suitable spotted frog habitat include: South Fork Sage Creek, Deer Creek, and the North Fork Deer Creek in the Manning Creek Tract and Slug Creek adjacent to the Dairy Syncline Tract. In addition, several perennial springs located within and adjacent to the tracts may provide habitat for this species. Field surveys of suitable habitat within both tracts during early and mid-Spring, 1995 did not result in the identification of any spotted frogs. Amphibians identified during these surveys included the western chorus and northern leopard frogs. Results of these surveys infer that spotted frogs are not present within either the Manning Creek or Dairy Syncline Tracts.

Trumpeter Swan (*Cygnus buccinator*)

No known recorded observations of this species have been documented within the general vicinity of the proposed lease tracts. Suitable habitat is located near Blackfoot Reservoir, Gray's Lake, and near the Salt River and Palisades Reservoir. These areas are between 20 and 25 miles from the Dairy Syncline and Manning Creek Tract respectively.

Harlequin Duck (*Histrionicus histrionicus*)

Suitable breeding and nesting habitat includes turbulent mountain streams. No sightings of harlequin ducks within or adjacent to the proposed lease tracts have been documented. Suitable habitat is generally lacking within both lease tracts.

Great Gray Owl (*Strix nebulosa*)

There have been no observations of this species within or immediately adjacent to either tract. Both areas are within its suspected range. Several great gray owl nest sites and sightings have been recorded in the Idaho Natural Conservation Data Base; 3 sites approximately 2-3 miles south and southeast of the Dairy Syncline Tract and 2 sites approximately 2 miles northwest of the Manning Creek Tract. Suitable nesting, roosting, and feeding habitat within and adjacent to both lease tracts exists. Extensive spring, 1995 surveys within both tracts (transect and vocalization) resulted in a single vocalization in the northern portion of the Dairy Syncline Tract which confirmed suspected presence of this species within this area. However, transect surveys failed to locate any nesting great gray owls. No observations or vocalizations of great gray owls were recorded within the Manning Creek Tract.

Flammulated Owl (*Otus flammeolus*)

There have been no observations of this species in either tract. Both areas are within the flammulated owl's suspected range. No inventories specific to the flammulated owl have been completed in the past for this portion of the Ranger District. Spring, 1995 transect and vocalization surveys were conducted within both lease tracts. No observations or vocalizations of the flammulated owl were recorded. Both tracts contain suitable flammulated owl habitat.

Boreal Owl (*Aegolius funereus*)

There have been no observations of this species on or immediately adjacent to the tracts. One boreal owl vocalization north of the Manning Creek Tract was recorded in 1991. In addition, a single recorded sighting is documented by the Idaho Conservation Data Center approximately four miles northwest of the Dairy Syncline Tract. No known nest sites have been identified.

Surveys conducted on the Caribou National Forest south of the Dairy Syncline Tract in 1985 failed to locate boreal owls, although some boreal owl vocalizations were reported. Transect and vocalization surveys for the boreal owl were also conducted within the proposed phosphate lease tracts. No observations or vocalizations were recorded. During spring surveys, a local landowner in the Crow Creek drainage indicated that he had observed a small owl in the lower elevations east of the Manning Creek Tract. Based on his description, the owl observed could have been a boreal. However, a visit to this area and use of amplified calling techniques failed to result in an observation or vocalization. Both tracts are within the suspected range of the boreal owl.

Three-Toed Woodpecker (*Picoides tridactylus*)

There have been no observations of this species within or adjacent to the tracts in the recent past. However, there have been no inventories specific to this species in the past for these portions of the Ranger Districts. Spring, 1995 surveys in the Manning Creek area resulted in a single observation of an adult three-toed woodpecker near the headwaters of Manning Creek within the Manning Creek Tract which confirmed the presence of the three-toed woodpecker within this area. No observations or calls of this woodpecker species were recorded within the Dairy Syncline Tract. Both tracts are within this species suspected range.

North American Lynx (*Felis lynx canadensis*)

There have been no observations of this species in either tract. Both the Manning Creek and Dairy Syncline Tracts are within the suspected range of this species. Review of existing information, including IDFG trapping data, indicates that no lynx have been observed or trapped within the study area in the recent past. Limited winter 1994/95 tracking surveys were conducted within both tracts. No lynx tracks were observed within either area. Both areas provide suitable habitat for this species.

Spotted Bat (*Euderma maculatum*)

There have been no observations of this species recorded in either tract. Both tracts are within the spotted bat suspected range. No specific bat surveys were conducted as part of this analysis. However, field reconnaissance of both areas indicated that suitable habitat exists in both tracts.

VEGETATION RESOURCES Including Old Growth and Timber

Introduction

This section describes the existing environment as it relates to Issues 3, 4, and 7:

- Issue 3 -** The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on wildlife and wildlife habitats including old growth vegetation.
- Issue 4 -** The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on wetlands, riparian areas, water quality, and fisheries in the Salt and Blackfoot River drainages.
- Issue 7 -** The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on the Treaty Rights of the Shoshone-Bannock Tribes

The southeast Idaho - western Wyoming areas described in this section have some common characteristics. The vegetation is mostly grass and low shrubs such as sagebrush. Aspen and coniferous forests occur at higher elevations on better and deeper soils, particularly on the northerly aspects.

The areas described here pertain to the potential lease areas and the surrounding area. As there would be impacts due to transportation systems outside the actual lease areas, the vegetative descriptions would also cover these areas.

Wetlands and riparian areas are discussed in more detail in the Fisheries and Watershed sections of this chapter.

Forest Plan Management Prescriptions

The Forest Plan selected areas for various types of management. Land was classified and the classifications shown on maps (Forest Plan). The Forest Plan Management Prescriptions categories that apply to the proposed lease areas are: Non-Intensive Range, Non-Intensive Timber, Semi-Primitive Recreation, and Water. Forest Plan Management Prescriptions involved with the proposed lease areas are mostly in Non-Intensive Management (Forest Plan Maps).

Vegetative Types

Vegetative types are a result of aspect, elevation, moisture, temperature and soils that combine to form a complex mosaic of vegetation types throughout the proposed lease areas. Vegetative types are broadly classified in the Caribou National Forest Plan. Vegetative types found in the proposed lease sites include: lodgepole pine, Douglas-fir, mixed conifer, aspen, aspen/conifer, timber encroachment, sagebrush and mountain brush. The riparian vegetation type is not included with previous types because it was not measured as a separate type in the Forest Plan. Riparian vegetation type takes up small narrow areas of the other types as the streams meander through the mosaic of vegetative types. The old growth areas can be in any of several of the above vegetative types and are, therefore, not a type by themselves but a portion of another type or types. The commercial forest types generally have potential yields in the medium to unproductive range. Heavily timbered stands are generally located on moist north and east slopes. Conifer and aspen dominate both proposed lease tracts.

Lodgepole pine type - the predominant species is lodgepole pine. Lodgepole usually acts as a seral species giving way, over time, to other species.

Douglas-fir type - the predominant species is Douglas-fir. It often acts as a climax species, but sometimes gives way to true firs.

Mixed Conifer type - contains a mixture of lodgepole pine, Douglas-fir, subalpine fir, and Englemann spruce. This type is often transitional between seral and climax.

Aspen - the aspen type is predominantly aspen, sometimes with a seedling or sapling stage of conifers. Aspen is a seral species which, in time, would gradually fill in and be taken over by conifers in the absence of fires or other disturbance.

Aspen/Conifer - this type is predominantly aspen but with a mixture of sawtimber sized conifers. It is transitional toward a conifer type.

Timber Encroachment - this type is usually a mountain brush type that is being invaded by conifers. Mountain brush is a seral type following a severe disturbance such as a very hot fire. It may take the site decades to centuries to recover enough for conifers to become reestablished depending on site/type characteristics.

Sagebrush - sagebrush is the predominant species. It occurs at lower elevation and on poorer sites than mountain brush. Other brush species include bitterbrush, rabbitbrush, serviceberry, and snowberry. Primary grasses include Idaho fescue, various other bunchgrasses, and Indian ricegrass.

Mountain Brush - dominated by shrub species such as bitterbrush, serviceberry, snowberry, chokecherry, mountain maple, mountain mahogany, juniper, and ninebark. Sagebrush may be present but only as a codominant species.

Wetland - typified by sedges, rushes, and similar grasses. It often has a shrubby overstory of willows and is found along the edges of streams, ponds, in poorly drained canyon and valley bottoms, and in higher mountain spring areas at the headwaters of streams. The vegetation is dependent on a water table at or very near the ground surface during most of the year (also refer to Chapter 3 Fisheries and Watershed for additional information).

Old Growth - Old growth classification is dependent on several characteristics such as tree size, number of trees per acre, age of trees, tree canopy layers, tree decadence, and characteristics of dead trees. Requirements for old growth depend on the vegetative types i.e.; old growth characteristics in lodgepole pine stands differ in size and stocking than those in Douglas-fir stands (also refer to Chapter 3, Wildlife for additional information).

Acreage in Table 3-8 are taken from Caribou National Forest vegetative type maps. Because the potential ore handling facilities and transportation systems are outside the proposed lease area boundaries, the acreage reported would not be identical with the proposed lease boundaries.

Harvest History

Minor forest products probably have been harvested from the proposed lease areas by native Americans longer than recorded history. There are no records of such harvests. Products would include lodge poles, berries, firewood and plants for food and medicinal purposes. Other products would include animals for food.

Timber has been harvested from the proposed Dairy Syncline lease area for many years. Historic logging in southeast Idaho started when settlers needed logs to build homes, barns, and fences. Most of the early harvests were timber high grade harvests for logs to use for railroad building. The vegetation in the proposed lease areas attracted early settlers primarily for livestock grazing.

In more recent times, timber sales from public lands were prepared and sold during the mid-1980's to present. In the last decade, two timber sales: Big Basin; and Huckleberry have had units included in the proposed Dairy Syncline Tract. There have been no timber sales in the proposed Manning Creek Tract.

Timber sales have been prepared and harvested to respond to timber management direction from the Forest Plan. The main objective of the timber sales was to provide timber for a growing United States economy and to salvage diseased and bug killed trees while maintaining or improving the spread of age classes and increasing structural diversity.

Manning Creek Tract

Resource management in the proposed Manning Creek lease area is the responsibility of the Montpelier Ranger District. Over 80 percent of the study area is covered by trees. Aspen is the most common timber type. The next most common tree cover is lodgepole pine, followed by Douglas-fir and then the mixed conifer type (Smith, Tat, personal communication, 1995). Most of the proposed lease area falls into the non-intensive prescription under the Forest Plan with about 10 acres in the non-intensive timber prescription (Caribou National Forest Land and Resource Management Plan). Less than 20 percent of the proposed lease area is in mountain brush or sagebrush. There are about 15 acres of wetland located along major streams (Figure 3-14). A timber sale is planned in the Manning Creek area that would partially lie within the proposed lease tract.

Four hundred fifty acres of the conifer stands within the proposed lease area and associated facilities are in the Timber Management prescription in the Forest Plan. The rest of the conifer stands fall into the Non-Intensive Management prescription in the Forest Plan which means that little or no management would have been allowed in them. Approximately 31 acres in three different areas meet the requirements of Old Growth under Region 4 guidelines. These consist of three small scattered pockets close to minimum acreage (10 acres) to meet the definition for functional old growth located in the timber management prescription area (Figure 3-12).

There are no known Proposed Threatened, Endangered or Sensitive plant species within the proposed lease boundary or external facilities. Biological evaluations were completed for: 1) the various timber sales harvested near the proposed lease area; 2) for range allotments; 3) for exploration for phosphate; and 4) for this EIS. A field survey for potential habitat for the three sensitive plant species known or suspected to exist on the Caribou National Forest was completed for this project. No habitat was found which would be likely to contain any of the three sensitive species. However, in October, 1996 *Spiranthes diluvialis* was added to the Forest-wide Species List (List# 1-4-96-265, File # 6118.00 and 111.000). Additional surveys will be completed for this species, before surface disturbance occurs.

Dairy Syncline Tract

Management of the resources for the proposed Dairy Syncline lease area is the responsibility of the Soda Springs Ranger District. The proposed lease area is generally on an east to northeast facing slope. North and east facing slopes are generally covered with timber where soils are suitable. South and west facing slopes generally have shallower soils and support grass, brush, and some aspen stands.

Most of the area (58 percent) is classified in the Non-Intensive prescription in the Forest Plan. About 28 percent is in the Timber prescription, 10 percent in Semi-Primitive Recreation prescription, 3 percent in Non-Intensive Timber prescription, and 1 percent in the Water

Prescription. Because the Water Prescription requires managing the forest overstory for water yield, the acres are included in the Timber acres.

Over 73 percent of the proposed lease area is covered by trees (mostly aspen). The next most common tree cover is Douglas-fir followed by mixed-conifer and lodgepole pine. Most of the remaining 26 percent of the acreage is in mountain brush or sagebrush types. There are 12 acres of wetlands in Green Basin. More than 80 percent of the commercial conifer stands in the proposed Dairy Syncline lease area have had some degree of timber harvest in the past, most of it a selection harvest for early railroad, home building, and firewood uses.

About 100 acres of conifer types in the north end of the proposed lease area are not readily accessible by existing road, which are classified in the Non-Intensive Timber prescription. These acres have not been affected by harvest activity in the past 50 years. Approximately 22 acres of the 100 acres meet the definition of old growth under Region 4 guidelines (Figure 3-13). Forest Plan prescriptions for these areas are either Non-Intensive Timber or Semi-primitive Recreation.

There are no known Proposed Threatened, Endangered or Sensitive plant species within the proposed lease boundary or external facilities. Biological evaluations were completed for: 1) the various timber sales harvested near the proposed lease area; 2) for range allotments; 3) for exploration for phosphate; and 4) for this EIS. A field survey for potential habitat for the three sensitive plant species known or suspected to exist on the Caribou National Forest was completed for this project. No habitat was found which would likely contain any of the three sensitive species.

Acreage of Land by Vegetative Type

Table 3-8 shows the acreage of land by vegetation type within the proposed lease study areas. These acres include those areas of conceptual waste dump and other facilities adjacent to the proposed lease area. They also include areas between the different potential transportation scenarios, thus the acres shown here are more than the acres of the proposed lease tracts and the potential acres disturbed.

The acreage calculated for Table 3-8 was determined from Geographic Information System (GIS) data for the Caribou National Forest. Some adjustments were made using personal experience of the Timber Staff on the Montpelier and Soda Springs Ranger Districts and from the Vegetative Type Implementation Map from the Caribou National Forest Land and Resource Management Plan.

Table 3-8 Acres by Vegetative Type Within the Proposed Phosphate Lease Areas

| Vegetative Type | Manning Creek | Dairy Syncline | Total |
|---------------------|---------------|----------------|-------|
| Lodgepole Pine | 630 | 300 | 930 |
| Douglas-fir | 400 | 530 | 930 |
| Mixed Conifer | 0 | 380 | 380 |
| Aspen | 510 | 1,110 | 1,610 |
| Aspen/Conifer | 30 | 90 | 120 |
| Timber Encroachment | 504 | 170 | 674 |
| Sagebrush | 10 | 140 | 150 |
| Mountain Brush | 410 | 730 | 1,140 |
| Rock or Bare | 0 | 50 | 50 |
| Total | 2,494 | 3,490 | 5,984 |

The acres of old growth and wetlands are shown in Table 3-9. These acres are duplicate acres of those shown in Table 3-8, as the inventory system did not differentiate the old growth and wetlands from other vegetative types.

Table 3-9. Acres of Wetlands and Old Growth in the Proposed Lease Areas

| Special Vegetation | Manning Creek | Dairy Syncline | Total |
|--------------------|---------------|----------------|-------|
| Wetland | 15 | 12 | 27 |
| Old Growth | 31 | 22 | 53 |
| TOTAL | 46 | 34 | 80 |

FISHERIES AND WATERSHED RESOURCES

This section describes the existing environment as it relates to Issue 4:

Issue 4 - The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on wetlands, riparian areas, water quality, and fisheries in the Salt and Blackfoot River drainages.

Introduction

The proposed lease tracts and potential transportation development areas provide suitable habitat for a variety of fish species. There is no suitable habitat for fish on the Dairy Syncline Tract itself.

A high degree of habitat diversity occurs within each of the two proposed lease tracts and their potential transportation development areas. In general, the Manning Creek Tract is relatively unroaded and contains riparian and fisheries habitat features that have not been heavily influenced by human activities other than livestock grazing. The Dairy Syncline Tract exhibits many characteristics of past activities including logging, road development, and livestock grazing.

Slug Creek and South Fork Sage Creek have been identified as Water Quality Limited Stream Segments.

Manning Creek Tract

Surface water within and adjacent to the area include Deer Creek, North Fork Deer Creek, South Fork Sage Creek, and Manning Creek drainages. Deer Creek, North Fork Deer Creek, and South Fork Sage Creek are considered perennial (Figure 3-14). These streams usually originate from springs either in the Thaynes or Dinwoody Formation high on the Webster Range. Maximum flow in the upper reach of the streams generally occurs where they cross outcrops of the Phosphoria Formation. The streams lose flow into the Wells Formation. Drainage of the lease tract is to the east and flows into Crow Creek and then north into the Salt River, which is part of the upper Snake River basin.

Manning Creek, upper reaches of South Fork Sage, and most of their tributaries are considered intermittent or ephemeral streams. The upper reaches of some streams and tributaries may be perennial in some years.

Dairy Syncline Tract

This tract is considered relatively developed with many miles of existing road, past and planned timber harvest activities, a snowmobile route that transects the area, and a high level of recreational use (primarily during the fall hunting seasons). Logging, mineral exploration, and development of roads by recreationists and woodcutters have increased access into the area.

The primary perennial stream is Slug Creek which is about 1/4 to 1/2 mile from the lease tract at its closest point (Figure 3-15). The area is generally drained by intermittent or ephemeral drainages, however springs, seeps and small perennial streams do exist within the analysis area. Slug Creek is a tributary to the Blackfoot River.

The Blackfoot River drainage is located in central Caribou County northeast of Soda Springs, Idaho. The watershed encompasses 906 km² (350 mi²) in Idaho and lies on the western face of the Webster Mountain Range-Great Basin Divide.

Fisheries and Watershed Resources Inventory

The proposed lease tracts and potential transportation development areas support a variety and diversity of riparian conditions and fish habitat. There is not fish habitat within the proposed Dairy Syncline lease tract. The following analysis describes watershed resources, fish presence, and fish habitat that could potentially be affected by proposed phosphate leasing and subsequent mining activities. An evaluation of a variety of fisheries and watershed features is provided along with a description of Proposed, Endangered, Threatened, and Sensitive fish species that could potentially be affected.

Hydrology

Rainfall, snowmelt, and ground water discharge are the contributors of streamflows within the study area. Snowmelt plays a major role in the physical characteristics of channels. The stream hydrography are typical of snow-dominated regions. Channel-forming flows occur during the spring snowmelt period, tapering off to groundwater fed base flows in the late summer, winter, and early spring. The area has an annual precipitation of 25 to 35 inches, mainly in the form of snow. However, precipitation associated with local convectional storms is common.

The Soils Resource section of this chapter describes the geology and soils of the analysis area. No water quality and quantity data could be located for the streams within the analysis area. With the exception of spot-check temperature measurements conducted during ROSGEN surveys conducted in 1994 and fish presence surveys in 1995, no stream survey data was available. Spot-checked stream temperatures ranged between 42 ° F during June, 1995 in the Deer and Sage Creek systems and 50 ° F during June, 1995 in Slug Creek.

Stream Morphology

Manning Creek Tract

Stream typing based on Rosgen (1994) was completed for Deer Creek, North Fork Deer Creek, and tributaries in the Manning Creek Tract (Figure 3-16). Refer to Fisheries and Watershed Resource Report in the analysis file for specific data and calculations.

Deer Creek. Stream type classification for Deer Creek varied depending on valley width and beaver activity. Beaver dams were the primary influencing factor affecting the geomorphology of reaches of this stream. Reaches were classified as "DA" and "G" type channels dominated by silts (DA6) and gravel (G4). Another reach was classified as a "B" type channel dominated by gravel substrate (B4).

North Fork Deer Creek. The North Fork of Deer Creek was classified as an "E" type channel dominated by gravel substrate (E4). "E" stream types are generally characterized by gentle gradient riffle/pool complexes. The morphology is generally characterized as having a narrow and deep channel (low width to depth ratio) with a wide, well-developed floodplain and high sinuosity.

Two tributaries to the North Fork were also surveyed. Tributary B of the North Fork was classified as a very steep-gradient "A" channel dominated by gravel substrate (A4a+). Type "Aa+" streams are very steep (greater than 10% slope) with frequently spaced, vertical drop/scour-pool bed features. Tributary C of the North Fork was classified as a very steep gradient "A" channel dominated by sand substrate (A5a+). This channel was very steep; however, beaver activity in the drainage provided sufficient topographic relief as to allow the accumulation of fine sediment (sand). In spite of this, stream gradient, width to depth ratio, and other measurements confirm an "A" type channel.

Dairy Syncline Tract

Slug Creek was assessed according to Rosgen (1994) during the 1995 field season. Due to a large number of multiple channels and their complexity, actual transect measurements were not completed. Instead, a qualitative estimate of Rosgen stream type was determined. Slug Creek, south of Section 21, was classified as a "DA" channel type characterized by multiple deep and narrow channels with a well-vegetated floodplain and wetland (Figure 3-17). There was gentle relief and stable banks. Beaver dams are the primary influencing factor affecting the geomorphology of this stream. Slug Creek, north of Section 21, was classified as a "DA" channel type characterized by a low gradient meandering alluvial channel with a broad, well defined floodplain.

Riparian Vegetation

Specific vegetation information can be found in the vegetation section of this chapter. In general, riparian vegetation is typified by sedges, rushes, and similar grasses with a shrubby overstory of willows. It is found along the edges of streams and ponds and in poorly drained canyon and valley bottoms (seeps and springs). It is dependent on a water table at or very near the ground surface during most of the year. This vegetation is particularly important for sediment control, streambank protection, fish habitat, and other wildlife habitat.

A Green Line Ecological and Stability Rating Analysis was completed on Slug Creek (Soda Springs Ranger District records). Results show Slug Creek to have an excellent stability rating and an ecological status of a Potential Natural Community (PNC). No specific riparian survey data was available for the Manning Creek analysis area. However, field reconnaissance in 1994 and 1995 confirmed healthy riparian areas in the Manning Creek Tract. Riparian areas were

dominated by a dense stand of willows with scattered pockets of aspen representing excellent horizontal and vertical diversity. Measurements indicated a G4 channel type for a small portion of Deer Creek. The estimated acres of riparian area within the lease tracts potentially affected by the potential development are in Table 3-10. This estimate is for riparian areas associated with perennial streams, seeps, and bogs. The vegetation, which is not wetlands, associated with intermittent or ephemeral streams is lumped into the upland vegetation type acreage estimates.

Wetlands

Wetlands within the analysis area have been identified by the U.S. Fish and Wildlife Service National Wetland Inventory (NWI) maps produced by interpreting aerial photography. Wetlands on the NWI maps are classified according to the Cowardin system (Cowardin et al. 1979). Referenced NWI maps include; Dry Valley (Dairy Syncline), Harrington Peak (Dairy Syncline), Stewart Flat (Manning Creek), and Snowdrift Mountain (Manning Creek), Idaho (Figure, 3-14, 3-15).

Wetlands, as defined by Section 404 of the Clean Water Act, are areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. This type of vegetation, known as hydrophytic vegetation, is one of the diagnostic environmental characteristics indicative of a wetland. A second diagnostic characteristic is the presence of hydric soils. Generally, hydric soils are those soils that have developed under anaerobic conditions due to saturation or inundation by surface or ground water. A third diagnostic characteristic is wetland hydrology defined as the permanent or periodic inundation or saturation of the soil to its surface.

Hydrophytic vegetation, hydric soils, and wetland hydrology are the three criteria that must be satisfied when making a wetland determination. Field visits on Deer and Slug Creeks and throughout the study area have confirmed the presence and location of the NWI mapped wetlands. The wetlands, however, are generally larger than those mapped. The field review found more shrub/scrub than emergent wetland, while the NWI maps showed more emergent than shrub/scrub wetland.

Many wetlands in the potential impact area are in the Palustrine category which means they are on the shores or banks of streams or ponds. The subsystem indicating the vegetation types is emergent, shrub/scrub, or open water. Emergent vegetation is herbaceous, while shrub/scrub is woody vegetation not large enough to be classified as trees.

Table 3-10- Estimated Acres of Wetlands/Riparian Area Within the Proposed Lease Tracts.

| Dairy Syncline Tract (refer to Figure 3-15) | | Manning Creek Tract (wetlands are associated with perennial streams [refer to Figure 3-14]) | |
|---|-------|---|-------|
| Stream/Area | Acres | Stream/Area | Acres |
| Green Basin | 12 | Deer Creek & Tribs | 8 |
| | | North Fork Deer Creek & Tribs | 6 |
| | | South Fork Sage Creek | 1 |
| Total | 12 | Total | 15 |

Wetlands are found throughout the riparian areas of the streams investigated. Many locations have beaver ponds with dense willow thickets along the banks. Some of these beaver ponds have been illustrated on NWI maps. The water regime varies in these areas from saturated to temporarily or seasonally flooded to permanently flooded. The emergent vegetation generally consists of rushes and sedges, while the broad-leaf deciduous vegetation includes several species of willow. Table 3-10 contains acreage of wetlands/riparian area within the proposed lease tracts. Acres were estimated from NWI maps and field reconnaissance. There are about 175 acres of wetlands/riparian areas near Wild Canyon, outside of the Dairy Syncline proposed lease tract to the east, but west of the Slug Creek road. These areas were estimated using the NWI maps.

Slug Creek and its associated riparian area and wetlands are outside the proposed lease tracts but could be within areas considered for surface/transportation facilities within the project area. Wetlands in the Green Basin area have the potential to be directly affected by potential development.

Manning Creek Basin Spring is a livestock water development. The length of Manning Creek was evaluated during the field reconnaissance to determine the type of stream (Class III-Intermittent) and validate the NWI maps. No jurisdictional wetlands were observed. The area had been impacted due to the water development and livestock use.

Fish Species

Manning Creek Tract

Snake River finespotted cutthroat trout (*Oncorhynchus clarki spp*) is the primary subspecies of concern for the Salt River system. Brook trout, brown trout, and whitefish are also present in the Salt River system (Platts, 1975). Other fish fauna of the Salt River system include the families of Cyprinidae (chubs), Catostomidae (suckers), and Cottidae (sculpins) (Platts, 1975).

Electrofishing was conducted in June of 1981 for the Smoky Canyon area to look for spawning cutthroat trout in the headwaters of the Salt River system. South Fork Sage Creek was sampled from the road crossing to the Forest Service boundary only in selected pools and undercuts. Brown trout, brook trout, and sculpin were the only species identified. However, sampling conducted by the IDF&G identified cutthroat trout in the South Fork of Sage Creek (Behnke, 1992 and Platts, 1975).

Sampling for the presence/absence of PETS fish species in South Fork Sage Creek and Deer Creek was completed on June 26, 1995.

South Fork Sage Creek. Selected pools and riffles within a 1,000-yard reach (beginning at the western edge of Section 18 and proceeding west to the middle of Section 18, see Figure 3-16) of South Fork Sage Creek were sampled using an electroshocker. Shocking conditions were good. Water clarity was good, and stream temperatures were approximately 42° F at 1000 hours.

No individuals of any fish species were found in South Fork Sage Creek. Unless there were errors made in sampling, this rules out fish presence at the time of sampling; it does not rule out potential seasonal or downstream use of this stream. However, streamflow conditions were probably most conducive to fish use during the time sampling was conducted. Streamflows in late summer and winter are extremely low and probably not favorable for fish use. Therefore, it is likely that South Fork Sage Creek does not directly provide significant habitat for local populations of fish within the Forest boundary. Indirectly, this stream provides a source of clean, cool water to downstream fish-producing reaches in the South Fork Sage Creek below the Forest boundary and in mainstem Sage Creek and Crow Creek.

Deer Creek. Every pool from the Forest boundary up stream approximately ½ mile and selected pools just below the confluence with North Fork Deer Creek were sampled using "hook and line" sampling methods. Sampling did not continue above the confluence of the North Fork of Deer Creek and on Deer Creek, because habitat conditions were similar on June 26, 1995. However, the reach labeled G4 on Figure 3-16 does not contain sufficient water during late summer to support fish. Therefore, it is believed that whatever was present below the North Fork would be present above until flows reseeded. Selected pools in the North Fork Deer Creek were sampled, but no capture occurred. The same species were observed in the North Fork as the Mainstem of Deer Creek. All pools were formed by beaver dams. Electroshocking was not performed due to the difficulty of shocking large beaver ponds. Sampling resulted in the catch of two finespotted cutthroat and three Yellowstone cutthroat trout. All fish ranged in size from eight to ten inches in length. Several larger fish of both varieties were observed but were not captured. No other species were observed or captured.

Dairy Syncline Tract

Yellowstone cutthroat (*Oncorhynchus clarki bouvieri*) are the indigenous species in the Blackfoot system. Cutthroat from several other demes have been introduced in the drainage including trout

from Bear Lake and Henry's Lake and finespotted cutthroat from the South Fork Snake River, Wyoming (Idaho Department of Fish and Game, 1978-1980). Biochemical genetic analysis in the Blackfoot River and tributaries, however, concluded that in spite of non-indigenous introductions, no genetically distinguishable difference from the Yellowstone cutthroat could be determined (Wishard, et.al., 1980).

Non-indigenous salmonids potentially present include brook trout (*Salvelinus fontinalis*) and rainbow trout (*Oncorhynchus mykiss*). Other fish fauna of the Blackfoot system include the families of Cyprinidae, Catostomidae, and Cottidae. These include (by common name) Utah sucker, carp, Utah chub, dace, sculpin, and shiner (Idaho Department of Fish and Game, 1978-80).

Electroshocking in 1978 and 1980 showed that the tributaries to the Blackfoot River contained salmonids, the majority being wild cutthroat and non-game species such as sculpins and dace. Cutthroat ranged from newly emerged to adult (spent spawners) (Idaho Department of Fish and Game, 1978-80).

Slug Creek. Every pool (accessible via hiking) from the Forest boundary upstream to the end of the analysis area was sampled using "hook and line" sampling methods. All pools were formed by beaver dams which made sampling difficult. Electroshocking was not performed due to the difficulty of shocking large beaver ponds (Lukens, 1995).

No individuals of any fish species were observed or captured in Slug Creek. Streamflow between beaver ponds was minimal reducing the potential for migration in this system.

Fisheries Habitat

Platts (1975) described fish and their habitats in a 1975 fisheries study. He refers to both varieties, the Henry's Lake (Yellowstone) cutthroat and the Snake River cutthroat, and rates the fishery value of each stream on a scale of 1 to 5.

Fishery value rating as described in Platts (1975):

- 5 = The aquatic environment produces excellent fish populations which are highly sought after by the recreationists. The stream or lake may contribute high numbers of fish to off-site streams receiving high recreation use.
- 4 = The aquatic environment produces good fish populations which are sought after by the recreationists. Or, the stream or lake contributes moderate numbers of fish to off-site streams receiving moderate recreation demand.

- 3 = The aquatic environment produces fair fish populations receiving some fishing pressure. Or, the stream contributes low numbers of fish to off-site streams used by recreationists.
- 2 = The aquatic environment produces some fish, but stream or fishery conditions do not attract the fishing recreationists. Or, there is opportunity for this stream to contribute a low number of fish to off-site streams.
- 1 = The stream provides no fishing, and if a fish population does exist, there still is no significant value.

Manning Creek Tract

Platts (1975) described fish and their habitat as follows:

South Fork Sage Creek "The South Fork Sage Creek contains predominantly cutthroat trout with low standing crops of brown trout and sculpin. The stream rates 3 and has some livestock influence. The upper stream section is ephemeral. Cutthroat trout are composed of both varieties."

Manning Creek "This stream is small, mainly ephemeral, has very little fishery value, and is rated 1."

North Fork Deer Creek "This small tributary is rated 2 because it has low fishery values. Livestock influence is minor, but predicted mining influence would be major. The stream contains both varieties of the cutthroat trout."

Deer Creek "This stream contains trout populations from the headwater to the mouth. Because of high standing crops of trout and fishing pressure, the stream is rated 4. Fish populations include both varieties of cutthroat trout along with brook trout, brown trout, and whitefish."

Data and field reconnaissance in the Summer and Fall of 1994 showed riparian condition and fish habitat to be in good condition in Deer Creek and North Fork Deer Creek with the exception of the G4 channel type (Figure 3-16) where summer low flow is limiting habitat utilization. These streams were generally characterized by large, deep pools created by the influence of beaver dams. Salmonids were observed in large numbers throughout Deer and North Fork Deer Creeks.

Deer Creek showed high levels of shade characterized by good horizontal and vertical vegetative diversity. This diversity provides for high quality and abundant food sources for fish. North Fork Deer Creek had less diversity in the form of shade and woody structure primarily through the reduction in the willow component in the riparian area. Beaver dams were the most significant factor affecting fisheries habitat in Deer Creek and North Fork Deer Creek.

A field reconnaissance of South Fork Sage Creek was conducted in June, 1995. While the South Fork provides a significant contribution in terms of water quality and quantity during the spring runoff season, it probably only provides fair to poor habitat for fish within the Forest boundary. Pools are relatively shallow and lack diverse hiding cover. Streamflow in the Summer, Fall and Winter probably limit fish use of this stream. South Fork Sage Creek below the Forest boundary, however, provides excellent habitat for salmonids. It supports important populations of brown and cutthroat trout.

Dairy Syncline Tract

Platts (1975) described fish and their habitat as follows:

Slug Creek "Slug Creek is one of the more important streams and is rated 4. Livestock is causing severe damage in certain stream sections and predicted mining influence would compound this. This stream contains cutthroat trout, brook trout, sucker, dace and sculpin."

Data and field reconnaissance in the Summer and Fall of 1994 showed riparian condition and fish habitat to be in good condition in Slug Creek through Sections 16, 21, 22, 27, 34 and 3 adjacent to the study area. This stream was generally characterized by large deep pools created by beaver dams. Beavers are the primary influencing role on fish habitat in this system.

Proposed, Endangered, Threatened and Sensitive Species (PETS)

The U.S. Fish and Wildlife Service list of Endangered, Threatened, candidates and proposed species for the Caribou National Forest (Species List 1-4-97-SP-115, March 20, 1997), the Regional Forester's Sensitive Species List (FSM 2670 August 1989), Idaho Conservation Data Center data (October 14, 1994), and Soda Springs and Montpelier Ranger District records were reviewed.

Following review of available information, it was determined that no endangered, or threatened fish species are potentially affected. It was determined, however, that one sensitive fish species could potentially be affected by project activities. The finespotted Snake River cutthroat trout (*Oncorhynchus clarki sp*) is the only sensitive fish species potentially present (Skully, 1995).

Species Occurrence

Finespotted Snake River Cutthroat Trout. The present, known distribution of the finespotted cutthroat trout extends in the Snake River drainage below Jackson Lake downstream to the Salt River. This distribution overlaps with the Yellowstone cutthroat trout (Behnke, 1992).

Behnke (1992) describes ecological characteristics and status of the finespotted cutthroat as follows:

"The finespotted cutthroat trout is not a single homogeneous stock in the Snake River drainage but consists instead of discrete populations. These populations follow two basic lifestyles. Migratory fish spend most of their lives in the main Snake River and return to tributaries to spawn. Nonmigratory stocks reside in tributary streams. The population structures and interactions between discrete stocks are complex and perhaps of a delicate balance easily upset by environmental modifications."

"The finespotted Snake River cutthroat is the only subspecies of cutthroat trout more abundant now than it was historically. There has been no marked reduction in abundance within its known historical range, and widespread propagation and introduction outside the range have increased its numbers."

RANGE AND LIVESTOCK RESOURCES

This section describes the existing environment as it relates to Issues 5 and 6:

- Issue 5 - The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on range livestock manageability.**
- Issue 6 - The effects of proposed phosphate leasing and subsequent exploration, mining, and development on the social and economic elements of southeast Idaho.**

Descriptions that follow use the most current available data from range allotment analysis, allotment management plans, environmental assessments for allotment management plans, and from Caribou National Forest personnel. See Figures 3-18 and 3-19 for allotment maps. Range condition classification comes from allotment analysis that was completed using older terminology. Therefore, the original terms (excellent, good, fair and poor range condition) have been converted to current (ecological seral stages) terminology.

General Description of the Affected Environment (Allotments) Involved

Manning Creek Tract

Manning Creek Sheep Allotment. The Manning Creek Tract includes portions (approximately 1,400 acres) of grazing units 1 through 4 that have productive, suitable sheep grazing areas of aspen and conifer vegetative types. Total acreage in the allotment is 6,726, of which 5,834 acres

are suitable. Elevations range from about 6,800 to 8,600 feet above sea level. Range condition in the 1975 range analysis was rated as late seral and possible potential natural community (PNC). Local Forest Service officers estimate that range condition may be better now than in 1975. Five sheep water developments are within the area according to the allotment map (see Figure 3-18).

Deer Creek Sheep Allotment. The Manning Creek Tract protrudes into a portion (approximately 260 acres) of this allotment in section 34. Elevations range from about 6,600 to 8,600 feet above sea level. Vegetative types in that area are predominantly aspen with some sagebrush and conifer. Total acreage within the allotment is 4,276, with 4,098 acres suitable for grazing. The stage was rated as mid seral and late seral in the 1959 and 1965 allotment analysis. There are no range improvements in the area.

Sage Creek Sheep Allotment. The north end of the Manning Creek Tract protrudes into an estimated 200 acres of this allotment. The vegetation is aspen, conifer timber, and mountain brush. Most of the conifer timber area is unsuitable for grazing. Total suitable acres within the 4,052 acre allotment are 2,118. Elevations range from about 6,800 to 8,700 feet above sea level. The 1978 allotment analysis rated stage as late seral for the suitable grazing area. There are no range improvements in the area. Smoky Canyon Mine currently operates north of the Manning Creek Tract. The Smoky Canyon lease covers approximately 320 acres of the allotment. Best estimates are that active mining from this mine will occur in the east part of the allotment within three years.

Sage Valley Cattle Allotment. Sage Valley Cattle Allotment is in the area that would be crossed by the Alternative 2 access road and potential development scenario B power line and tailings line as shown on the mine development scenario map (Figure 2-5 conceptual mining plan (Chapter 2)). Vegetative types in the area are predominantly sagebrush and aspen. The stage was classed as mid seral and late seral in the 1974 range allotment analysis. There are a total of 2,100 suitable acres within the 2,140 acre allotment. Elevations range from about 6,500 to 7,500 feet above sea level. Two livestock watering ponds are located in the general area of the potential facilities (see Figure 3-18). The existing Smoky Canyon phosphate lease includes approximately 340 acres in the northwest portion of this allotment.

The following three allotments would be affected to a lesser degree by mining and related activities according to the conceptual mining plan. Stewart Canyon Sheep Allotment and Diamond Creek Cattle Allotment would have a portion of a potential slurry line across small portions of the allotments according to Alternatives 1, 4, and 5, potential Development Scenario B. Portions of the allotments that would be crossed are described as follows:

Stewart Canyon Sheep Allotment. Approximately one-half mile of slurry line could possibly be located on this allotment in its southeastern corner. The area is suitable range in mid seral stage in conifer timber vegetation according to the 1973 allotment analysis map.

Diamond Creek Cattle Allotment. An estimated three and one-half miles of slurry line could cross this allotment along Diamond Creek Canyon and near the road. This is all suitable rangeland in the conifer timber and grassland vegetative types. The stage, according to the allotment analysis map (undated, assumed to be 1971 the same as allotment analysis compilations), is mid to late seral.

Pole Canyon Sheep Allotment. This allotment could be crossed by an estimated two and one-half miles of tailings line and an estimated one-half mile of power line according to Alternatives 2, 4, and 5, potential Development Scenario B. The area that could be crossed is all suitable rangeland in the aspen vegetative type. Seral stage in that area is late seral according to the 1980 allotment analysis.

Dairy Syncline Tract

Dry Valley Cattle Allotment. This allotment is divided into 12 units within four divisions. The Dairy Syncline Tract includes an estimated 2,350 acres within grazing Units 4, 5, and 6 of the Slug Creek Division and approximately 370 acres in Unit 3 of the Johnson Creek Division. A railroad, slurry line, haulroad, tailings line, tippie, ponds, etc., could be located in portions of the South Dry Valley and North Dry Valley Divisions based on the conceptual mine plan.

Table 3-11 Suitable Livestock Grazing Acres by Vegetative Type, Dry Valley Cattle Allotment

| Vegetative Type | Suitable Acres |
|-----------------------|----------------|
| Grass | 1,130 |
| Wet Meadow | 280 |
| Dry Meadow | 2,209 |
| Sagebrush | 3,857 |
| Browse | 2,533 |
| Coniferous timber | 726 |
| Aspen | 5,762 |
| Mixed conifer & aspen | 2,093 |
| TOTAL | 18,590 |

Vegetative types are primarily aspen, grassland, mountain meadow, mixed conifer with aspen, mountain shrub, and sagebrush-grass. About 79 percent of the allotment is suitable for grazing. Table 3-11 shows suitable acres by vegetative types for the allotment as a whole from an undated (probably 1975) range analysis report. These figures include adjacent lands consisting of 160 acres of BLM land and 920 acres of State land. The total allotment area, including unsuitable rangelands, is 23,447 acres. Elevations range from about 6,600 to 7,600 feet above sea level.

Seral stage at the time of the above report is believed to be: close to potential natural community (PNC), 31 percent, late seral, 48 percent, mid seral, 17 percent, and early seral, 4 percent. Local Forest Service officers estimate that overall range condition may be better now than in 1975.

Water is scarce in upland areas, so livestock watering ponds and spring developments with pipelines and troughs have been constructed away from natural

streams. Fences separate the grazing units. See Figure 3-19 for the locations of range improvements.

Phosphate mining occurred on this allotment as early as the 1960's. Current operations are the Mountain Fuel Mine in South Dry Valley and the Champ Mine in North and South Dry Valley divisions. They are in the reclamation stage or have been returned to multiple-use management. Large mined areas have been revegetated and reclaimed as rangeland. Some revegetated areas (230 acres) of the Champ Mine area in Unit 9 of the South Dry Valley Division are now available to the permittees for grazing according to personnel of the Soda Springs Ranger District. Acreage by vegetative types now includes more grassland and less aspen and coniferous timber than shown in Table 3-8 due to mining and reclamation of mined areas.

Slug Creek Sheep Allotment. A small portion of this allotment (the northwestern corner) is within the Dairy Syncline Tract. Approximately 430 acres of aspen, conifer, and sagebrush are included. The 1966 range analysis data showed the aspen and conifer areas to be in late seral or PNC seral stage. The sagebrush areas are in mid seral and early seral stages. Total suitable acres in the allotment are 6,307. Total acres within the allotment are 6,337 acres. Elevations range from about 6,800 to 8,500 feet above sea level. There are no range improvements in this area.

Grazing Permits Potentially Affected

This section identifies grazing permit operations, obligated numbers of livestock, and/or seasons of use that could potentially be affected.

Manning Creek Tract

Manning Creek Sheep Allotment. A single grazing permittee is authorized to graze 1,128 sheep for the season of July 5 to September 20 (2,820 sheep months). In addition, the permittee is authorized to graze 226 sheep months on adjoining state land (section 36) near the southeast corner of the allotment. The combination results in a total permit for $2,820 + 226 = 3,046$ sheep months. The tentative estimated grazing capacity is 3,084 sheep months according to the 1978 allotment management plan.

Deer Creek Sheep Allotment. Two grazing permittees are authorized a total of 665 sheep for the season July 1 to September 15 (1,663 sheep months). The average actual use was 1,375 sheep months during the four years preceding 1972 according to the 1972 revision to the allotment management plan. The tentative estimated grazing capacity according to the 1966 allotment management plan was 2,027 sheep months.

Sage Creek Sheep Allotment. Two permittees are authorized to graze 1,000 sheep from July 1 to August 30 making 2,000 sheep months. Estimated grazing capacity in 1980 was 1,727 sheep months.

Sage Valley Cattle Allotment. Two grazing permittees are permitted a total of 187 cattle from June 1 to September 30 for 748 cow months. The grazing capacity was estimated in 1978 at 748 cow months.

Permits on the following allotments could be temporarily affected.

Stewart Canyon Sheep Allotment. One permittee is authorized to graze 1,195 sheep from July 6 to September 10 for 2,669 sheep months. Grazing capacity was estimated in the 1978 allotment management plan to be 3,678 sheep months.

Diamond Creek Cattle Allotment. Two permittees hold a joint grazing permit for 280 cattle from June 11 to October 10 for 1,120 cow months. Grazing capacity was estimated in the undated (probably 1994) allotment management plan to be 1,487 AUM's or 282 cow/calf pairs for 4 months.

Pole Canyon Sheep Allotment. One permittee holds a permit to graze 1,000 sheep for a season of July 1 to August 31 for 2,000 sheep months. The grazing capacity was estimated in the 1986 allotment management plan at 2,000 sheep months.

Dairy Syncline Tract

Dry Valley Cattle Allotment. Total grazing permitted or authorized on the allotment in 1994 was 1,588 cattle (owned by seven permittees) for the season of June 6 to September 20 making 5,438 cow months. Average total actual use during 1980 to 1985 was 5,333 cow months. Based on 1970 and 1971 range allotment analysis, there is a total available capacity of 8,471 cow months. Following is a breakdown by division for the four divisions of this allotment:

Slug Creek Division. The authorized season of use is June 6 to September 20 for 328 cattle making 1,123 cow months. Average actual use between 1980 and 1985 was 1,542 cow months. Three permittees are involved.

Johnson Creek Division. Two permittees are authorized 117 cattle from June 6 to September 20 making 401 cow months. Average actual use from 1980 to 1985 was 439 cow months.

South Dry Valley Division. Two permittees are authorized to graze 473 cattle for the season June 6 to September 20 making 1,620 cow months. Average actual use from 1980 to 1985 was 1,482 cow months.

North Dry Valley Division. Two permittees are authorized to graze 670 cattle from June 6 to September 20 making 2,294 cow months. Average actual use between 1980 and 1985 was 1,870 cow months.

Slug Creek Sheep Allotment. The authorized grazing is one permittee with 1,200 sheep from June 18 to September 20 making 3,000 sheep months. Average actual use was 2,623 sheep months for the 10 years prior to 1966 according to the 1967 allotment management plan. The tentative estimated grazing capacity is 3,694 sheep months according to that same plan.

Grazing Units, Patterns and Type of Grazing System Used

Manning Creek Tract

Manning Creek Sheep Allotment. This allotment has four units and is grazed on a rest and deferred rotation grazing system. One unit is rested each year.

Deer Creek Sheep Allotment. Four units are grazed on a rest and deferred rotation grazing system. One unit is rested each year.

Sage Creek Sheep Allotment. There are four units grazed on a deferred rotation grazing system.

Sage Valley Cattle Allotment. Two grazing units are grazed on a deferred rotation system.

Stewart Canyon Sheep Allotment. Four grazing units are grazed on a rest rotation grazing system.

Diamond Creek Cattle Allotment. The grazing system used is a five-pasture deferred rotation.

Pole Canyon Sheep Allotment. A three-pasture deferred rotation grazing system is used.

Dairy Syncline Tract

Dry Valley Cattle Allotment. Each of the four divisions have three units grazed on a deferred rotation grazing system.

Slug Creek Sheep Allotment. This allotment has four units that are grazed using a rest-rotation grazing system.

Livestock Trailing and Trucking Routes

Following is a description of routes and means taken to get livestock for individual allotments to and from rangeland.

Manning Creek Tract

Manning Creek Sheep Allotment. Sheep usually trail onto this allotment from the south across Montpelier-Elk Valley Allotment. The sheep are removed from the allotment by trucking from the Crow Creek Road near the mouth of Manning Creek.

Deer Creek Sheep Allotment. Sheep are usually hauled by truck to this allotment near Nate Canyon. They are removed by trailing across Montpelier-Elk Valley Allotment to the south.

Sage Creek Sheep Allotment. The sheep get to the allotment by trailing via Diamond Creek to the northwest. They trail off in the Fall to a corral to the northwest in Coyote Creek, a tributary of Diamond Creek.

Sage Valley Cattle Allotment. Cattle are trailed onto the allotment from adjacent private land in Crow Creek. They return by trailing off the allotment in the Fall.

Dairy Syncline Tract

Dry Valley Allotment. Cattle trail onto this National Forest allotment from adjacent State, BLM, and private land.

Slug Creek Sheep Allotment. Sheep have traditionally trailed from Blackfoot River Road to the allotment.

Adjacent and Nearby Land Grazed by Allotment Permittees

Manning Creek Tract

Manning Creek Sheep Allotment. Approximately 550 acres of State land in section 36 is grazed as part of this allotment. The State land is assigned 226 sheep months of use.

Diamond Creek Cattle Allotment. Private land consisting of 159 acres is grazed as part of this allotment under a private land permit for 10 head of cattle for 4 months.

Dairy Syncline Tract

Dry Valley Cattle Allotment. Adjacent to the allotment, 920 acres of State land and 160 acres of BLM land is grazed as part of this allotment. The total of these land ownerships is grazed by 84 cow/calf pairs June 6 to September 20 for 294 cow months. Adjacent private land is grazed by allotment permittees, and some of them hold permits to graze other adjacent BLM land.

Noxious Weeds

There are some noxious weeds in both the Manning Creek and Dairy Syncline areas. The Forest Service, Bureau of Land Management, State of Idaho, Caribou and Bear Lake Counties, and private landowners are all concerned about controlling their spread.

Of greatest concern in the proposed lease tracts are: Canada thistle; musk thistle; toad flax; and Dyers' woad. These noxious weeds are currently found within this area. Continued efforts would be necessary to keep these plants from spreading and becoming a problem in these areas.

SOCIOECONOMIC RESOURCES

This section describes the existing environment as it relates to Issue 6:

Issue 6 - The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on the social and economic elements of southeast Idaho.

Introduction

This section discusses the socioeconomic aspects of the area affected by the decision to lease or not lease the Dairy Syncline and Manning Creek Tracts. As with most economic studies, the ripple effect would take place beyond the borders of the area primarily affected. This analysis is confined to Bannock and Caribou Counties in Idaho and Lincoln County in Wyoming. Phosphate processing plants are located in the Soda Springs area of Caribou County and the Pocatello area of Power County. These plants are dependent on the ore mined in Caribou County. Phosphate mining and processing employs 14 percent of the work force in Caribou County, 9 percent of the work force in Lincoln County, and 4 percent of the work force in Bannock County. Phosphate processing plants are located in Power County, but most of the employment impact is in Bannock County. Most workers at the Smoky Canyon Mine live in Lincoln County, Wyoming, while working in Caribou County, Idaho. Residents of Bannock and Bear Lake Counties also work in the phosphate mines of Caribou County. Bannock, Caribou, and Lincoln Counties were selected to report on, because statistics relating to the phosphate work force are available for these counties and the bulk of the impacts are in these three counties.

Caribou County, Idaho

In the mid 1970s, the producers of phosphate in southeast Idaho were gearing up for expansion. At that time, several studies were undertaken to project the socioeconomic impacts of increased phosphate mining in this part of the state and in the adjoining affected Wyoming counties (USDI-USGS, BLM, and USDA Forest Service, 1977; pg. 1-327). Projections made using the Idaho Population/ Economic Forecasting Model (IPEF-76)(USDI-USGS, BLM, and USDA Forest Service, 1977; pg. 1-327) projected Caribou County's population with phosphate mining to be 11,692 in 1990 and 12,218 in 1995. Caribou County population was 6,963 in 1990 and projected to be 8,040 (most has already been realized) in 1995 (Bensen and Stegner, 1995). The increases were less than expected. Population in Caribou County is projected at 8,870 in 2000 and 9,580 in 2005 (Bensen and Stegner, 1995. pg.22).

The demand for U.S. phosphate has dropped nationwide due to decreased sales to China, increased imports from the former Soviet Union, and decreased demand for phosphate in laundry detergents due to environmental impacts (USDI, BLM, 1994). However, production has been shifting somewhat from the east to the west.

Idaho remains the second ranked state in terms of the amount of marketable phosphate rock output (USDI, BLM, 1994). All Idaho producers further refine the phosphate rock before selling it. Producers in Idaho primarily sell elemental phosphorus and phosphoric acid. Sometimes byproducts are extracted from the waste generated in phosphate product production. In 1991, 4.3 million tons of phosphorous rock was mined in southeast Idaho. This amount increased to about 5.7 million tons in 1995 (Table 3-12).

Bannock County, Idaho

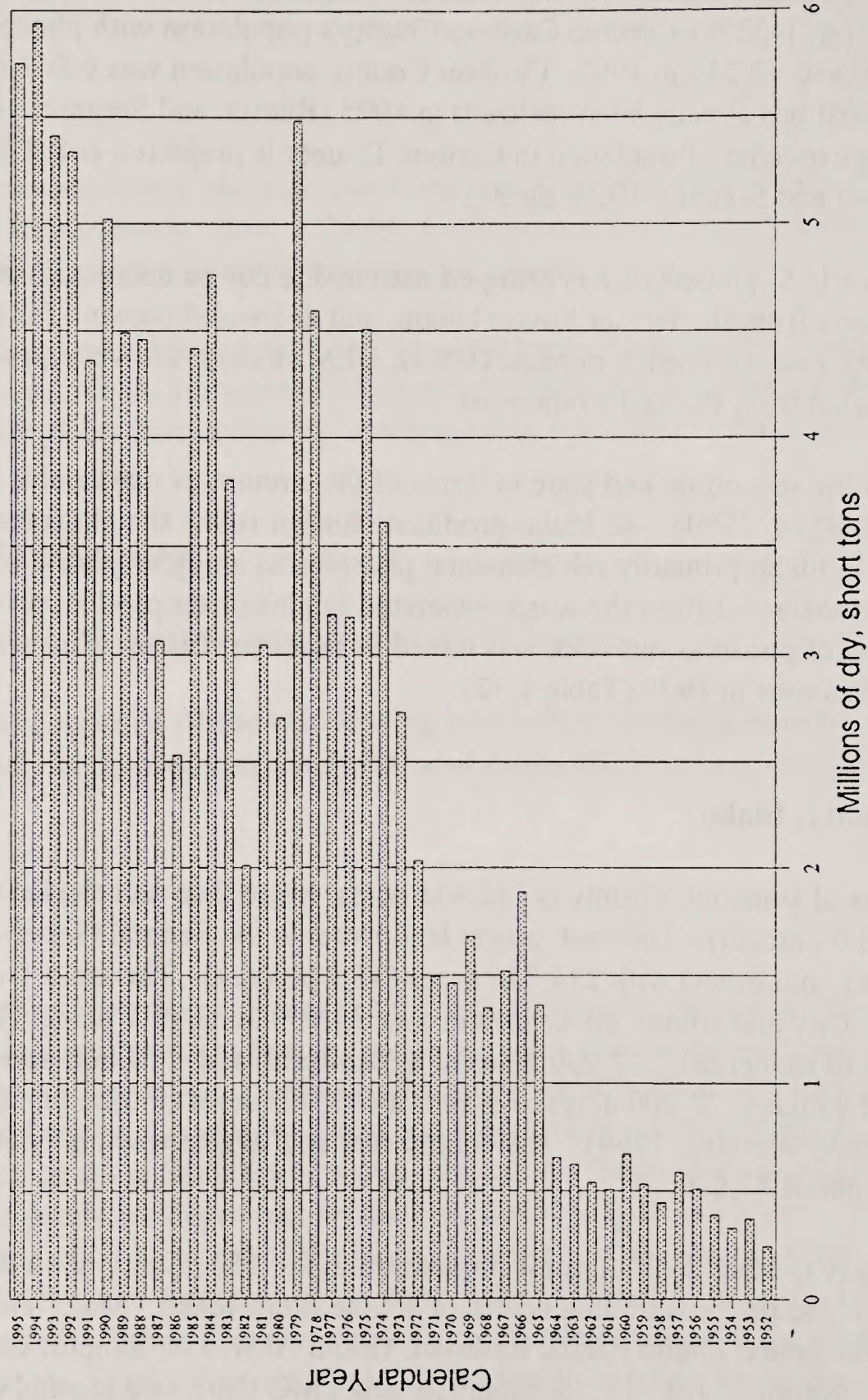
Total land area of Bannock County is 712,448 acres. More than half the land is in private ownership (58.6 percent). The next largest landowner is the Federal Government (BLM, National Forest, and other) with 234,726 acres (32.9 percent). The state owns 48,316 acres (6.8 percent). City and county governments own 11,900 acres (1.7 percent). There are over 343,000 acres of rangeland, 237,000 acres of agricultural land, 118,000 acres of forestland, 9,000 acres of wetland, 22,000 acres of water, and 9,000 acres of urban land (Idaho Department of Commerce, 1994). The county seat and largest town is Pocatello with a population of about 47,900.

Bannock County is Idaho's fifth largest population base. The county has a diversified economy and is the regional trading center of southeastern Idaho. Major employers include Idaho State University, Union Pacific Railroad, Gould AMI, J.R. Simplot Co., FMC Corp, and Foodways National, Inc. J.R. Simplot Co. and FMC Corp. are located in Power County. Most of the work force, however, is from Bannock County. Phosphate processing is a large employer in this county. Hunting, fishing, and other outdoor recreation are important in the county.

Table 3-12 Phosphate Produced Per Year

Idaho Phosphate Production

Federal Lands



Caribou County, Idaho

Caribou County is located just north of Bear Lake County. Total land area is 1,130,304 acres. Private land amounts to 570,844 acres (50.5 percent). Next largest landowner is the Federal Government (BLM, National Forest, and other) with 445,877 acres (39.4 percent). The state owns 110,763 acres (9.8 percent). City and county governments own 2,820 acres (0.2 percent). There are over: 767,000 acres of rangeland; 300,000 acres of agricultural land; 37,000 acres of forestland; 5,000 acres of wetland; 22,000 acres of water; 2,000 acres of bare land; and 4,000 acres of urban land (Idaho Department of Commerce, 1994). The county seat and largest town is Soda Springs with a population of about 3,100.

Farming/livestock raising and phosphate mining/processing are the major sectors of the county's economic base. Recreation in the form of hunting and second-home developments is the largest recreation impact from outside the county. Local residents also enjoy fishing, hunting, and winter sports such as snowmobiling and cross country skiing.

Lincoln County, Wyoming

Lincoln County, Wyoming is located just east of both Bear Lake and Caribou Counties in Idaho. Total land area is 2,677,475 acres. The largest landowner is the Federal Government (BLM, National Forest, National Park, Bureau of Reclamation, and others) with 1,938,293 acres (72.4 percent). Private land amounts to 577,712 acres (21.6 percent), and the state owns 154,753 acres (5.8 percent). City and county governments own 195 acres (<1 percent). Water surface accounts for 6,522 acres (State of Wyoming, 1994). The county seat and largest town is Kemmerer.

The economic base of Lincoln County is agriculture/livestock and mining/processing. Coal mines near Kemmerer account for most of the mining activity. Star Valley, in which the town of Afton is located, is a rich agricultural valley and serves as a residence community for miners working in Idaho's phosphate mines, almost exclusively the Smoky Canyon Mine. It is the nearest populated area to the Manning Creek Tract. Recreation is important in terms of hunting and dude ranching. Star Valley is famous for its cheese production. In the past, an aircraft factory, sawmill, and cogeneration plant were located in Afton. Phosphate mining has helped the Star Valley area to rebound economically from these losses.

Population

The counties in this part of the United States are sparsely populated. The people themselves usually prove to be good workers and adapt to changing jobs if necessary. Mine workers are unique among specialized workers in that they are very mobile and move quickly to where the jobs are available. The following county data was obtained from Idaho Department of Commerce, 1994.

In Bannock County, the population was 52,200 in 1970, 65,421 in 1980, 66,026 in 1990, and 68,561 in 1992. Population density ranged from 46.9 to 61.6 people per square mile. About 57 percent of the people are in the 18 to 64 year range with a median age of 29.5 years. Total employment is about 33,000. Over 1,000 people are employed in phosphate processing plants. The annual unemployment rate varied from 6.4 percent to 7.2 percent, and per capita income rose from \$8,400 to \$14,900 over this time.

In Caribou County, the population was 6,534 in 1970, 8,695 in 1980, 6,963 in 1990, and 7,115 in 1992. Population density ranged from 3.7 to 4.9 people per square mile. About 50 percent of the people are in the 18 to 64 year range, with a median age of 30 years. Total employment ranged from 4,165 to 4,936 people over this period, with 904 people employed in mining and processing in 1980, declining to 548 in 1992. The annual unemployment rate varied from 4.4 percent to 7.2 percent, and per capita income rose from \$9,854 to \$15,029 over this period.

In Lincoln County, the population was 12,625 in 1990. Population density was 3.0 people per square mile. The median age was 29 years. Total employment in 1990 was 5,664 and unemployment was 4.5 percent. Per capita income was \$10,668. Mining employment ranged from 560 to 698 from 1988 to 1992 with the highest rate in 1992. The new phosphate mine west of Afton undoubtedly helped to increase the mining work force, but coal mining near Kemmerer helped to maintain this rate of employment.

Mining Employment

Mines provide basic employment for people extracting, transporting, and processing ore into products. The more processing done in the county, the more jobs are available to the county. Wherever the ore is processed, it provides a substantial number of jobs. The amount of ore typically mined from a southeast Idaho phosphate mine averages 1 million to 2 million tons per year. This amount is generally increased or decreased depending on final demand for the product.

Two of the mines extract ore and ship it to the Pocatello area for processing. Mining of the ore alone would result in 45 to 50 jobs per million tons of ore. Partially processing the ore for shipment would take approximately 50 to 65 people per million tons. Fully processing the ore to a final product would add another 500 to 550 people per million tons of ore. Each 1 million tons of ore (the approximate yearly output of one of the existing mines) provides jobs for 600 to 700 people in the three-county area (Conroy, 1995; Clark, 1995; and Mapes, 1995).

Timber Employment and Economics

The amount of timber harvested from the Caribou National Forest is not large. The annual harvest is projected to be about 10.5 million board feet. There is one small manufacturing facility

in Bear Lake County that produces about 15 million board feet per year. The Louisiana Pacific mill in Rexburg has recently closed down and it does not appear likely to reopen. Most of the harvest on the Forest has been by ground based equipment. With modern equipment, one worker can harvest about one million board feet per year. One trucker can haul about 2 million board feet of logs per year on average depending on the length of the haul.

Grazing Employment and Economics

Both cattle and sheep graze on allotments leased from the Caribou National Forest. Portions of some allotments are within the proposed lease areas. There are four sheep and two cattle allotments potentially affected by the proposed Manning Creek lease. There is one cattle and one sheep allotment potentially affected by the proposed Dairy Syncline lease.

Multipliers

The multipliers for basic jobs which include agriculture, mining, logging, and manufacturing usually range from 2.5 to 5.0. A multiplier of 2.8 is used for the phosphate sector in studies done by Idaho State University (USDI-USGS, BLM, & USDA Forest Service, 1977). This means that for every job added or lost due to changes in mining or processing employment, another 2.8 jobs are added or lost throughout the local county economies. A recent study from Utah State University found that multipliers for range fed cattle and sheep had total income multipliers of about 4.4 (Keith, 1993a). This same study by Keith (1993a) found a value added multiplier of 4.1 and an employment multiplier of 2.1 and 2.2 for range fed cattle and sheep. Another study calculated a multiplier of about 3.5 (Nielson, 1994) for range fed cattle and sheep (this was used in this EIS).

Employment and Population

Employment in the phosphate mines and processing plants represents a substantial amount of the affected counties' economy. In Caribou County for instance, mining and processing directly accounted for 14 percent of the jobs, and indirectly for 20 percent of the jobs for a total of 31 percent of the jobs in the county. Lincoln County is similar to Caribou County in the percentage of mining jobs (State of Wyoming, 1994). Bear Lake County does have some mining employment. Rhone-Poulenc had an office in Montpelier, and some miners live in Bear Lake County but work elsewhere.

Population increases accompany increases in job numbers. New jobs usually result in immigration for the type of labor needed. While employment may increase, it is usually the result of service sector jobs increasing rather than opportunities in the basic industry. The increased population associated with new jobs is in the ratio of about 2.74 per basic industry and non-basic industry

jobs combined (for each 100 basic jobs, 180 non basic jobs would be added, for the 280 jobs created, the population would increase by 767)

CULTURAL RESOURCES

Introduction

Appendix E contains a more complete background.

Human occupation of southeastern Idaho spans some 12,000 years. During the Paleo-Indian period (ca. 14,500 to 7,000 B.P.), prehistoric groups traveled over vast annual ranges while hunting large migratory animals. As those animals disappeared at the end of the Paleo-Indian period and beginning of the Archaic period (ca. 7,000 to 300 B.P.), groups began exploiting a wider array of resources such as plants and anadromous and resident fish. Ancestors of the Shoshone-Bannock Tribes most likely arrived in southeastern Idaho during the last 400 years of the Archaic period.

Euroamerican explorers and fur trappers began traveling through southeastern Idaho in the early 1800s. The Astorians were one of the first groups to travel through the area. They were followed by well-known explorers such as Bonneville, Wyeth, Fremont, and Goodhart. Large groups of emigrants traveled to Oregon via the Oregon Trail beginning in the early 1840s, and Mormon emigrants began to settle parts of southeastern Idaho in the early 1860s. Between the 1860s and 1890s, mining attracted a host of Euroamericans and East Asians. The westward migration also created the need for railroads and railroad workers, as well as the incentive for ranchers, farmers, and service industries to come to the area.

During the late 1890s and throughout the early part of the twentieth century, the Federal government became increasingly involved with land administration in southeastern Idaho. Most of the remaining arable land was settled by 1930, largely a consequence of the Carey Act of 1894 and the Reclamation Act of 1902, although marginal areas were soon abandoned due to lowered water tables and severe drought. Various Federal agencies, such as the Forest Service, the Grazing Service and eventually, the Bureau of Land Management began to administer vast tracts of land in southeastern Idaho.

Cultural Resource Investigations in the Proposed Tracts and the Immediate Vicinity

Although four cultural resource inventories have been conducted in portions of the proposed lease tracts, no prehistoric or historic sites have been recorded (Table 3-13). Cultural resources have been identified by inventories conducted in the immediate area; however, (Table 3-13) they include seven prehistoric lithic scatters (10CU67, 77, 78, 79, 88, 89, 90, and 96), two historic dairies (10CU94 and 95), two historic tree carvings (10CU112, and 113), one historic field site

(10CU76), and one historic cabin (10CU183). The presence of these archaeological and historical sites, along with other known sites in the immediate vicinity (Table 3-14), suggests that the uninventoried areas of the proposed tracts have a low probability for cultural resources but a probability nevertheless.

**Table 3-13 Cultural Resource Inventories
Conducted Within and Adjacent to Proposed Leasing Tracts.**

| Area | Forest Service Report No. | Acres Inventoried | Cultural Resources Located |
|--|------------------------------|----------------------|----------------------------------|
| Dairy Syncline Tract | CB-84-134 | 812 | 0 |
| | CB-91-217 | 320 | 0 |
| Manning Creek Tract | CB-92-262 | unknown | 0 |
| | CB-93-307 | unknown | 0 |
| Area Near Proposed Leasing Tracts | CB-91-215 | 200 | 0 |
| | CB-92-263 | 400 | 0 |
| | CB-94-333 | unknown | 0 |
| | CB-94-337 | 9 | 0 |
| | CB-94-361 | 3 | 0 |
| | CB-84-135 | 680 | 0 |
| | CB-91-218 | 792 | 0 |
| | CB-93-306 | 135 | 1 |
| | CB-93-312 | 0.2 | 0 |
| | CRM-CB-684 | unknown | 7 |
| | CRM-CB-119 | unknown | 5 |

**Table 3-14 Previously Recorded Cultural Resources
in the Vicinity of the Proposed Leasing Tracts.**

| Site No. State No./Caribou No. | Site Description | Forest Service Report No. |
|-----------------------------------|----------------------------|------------------------------|
| 10CU127/CB-97 | Johnson Guard Station | CB-85-146 |
| 10CU183/CB-157 | Historic Cabin | CB-93-306 |
| 10CU67/CB-5 | Prehistoric Lithic Scatter | none * |
| 10CU68/CB-7 | Crow Creek Freight Trail | none * |
| 10CU77/CB-34 | Prehistoric Lithic Scatter | CRM-CB-684 |
| unknown/CB-104 | Clear Creek Guard Station | CB-85-147 |
| 10CU76/CB-33 | Historic Field Site | CRM-CB-684 |
| 10CU78/CB-35 | Prehistoric Lithic Scatter | CRM-CB-684 |
| 10CU79/CB-36 | Prehistoric Lithic Scatter | CRM-CB-684 |
| unknown/CB-70 | Halfway House | none * |
| 10CU93/CB-80 | Historic Smith Sawmill | CRM-CB-64 |
| 10CU88/CB-75 | Prehistoric Lithic Scatter | CRM-CB-684 |
| 10CU89/CB-76 | Prehistoric Lithic Scatter | CRM-CB-684 |
| 10CU90/CB-77 | Prehistoric Lithic Scatter | CRM-CB-684 |
| 10CU96/CB-47 | Prehistoric Lithic Scatter | CRM-CB-119 |
| 10CU94/CB-45 | Historic Dairy | CRM-CB-119 |
| 10CU95/CB-46 | Historic Dairy | CRM-CB-119 |
| 10CU112/CB-94 | Historic Tree Carving | CRM-CB-119 |
| 10CU113/CB-95 | Historic Tree Carving | CRM-CB-119 |

* Individual site forms are located in the Forest Service files, Pocatello, Idaho.

AIR RESOURCES

Air quality is administered by the Environmental Protection Agency (EPA) unless the state is given primacy. In this study area (southeast Idaho), a state agency enforces EPA rules over air in this instance. In Idaho, the Department of Health and Welfare, Division of Environmental Quality (DEQ) administers the Clean Air Act rules and Clean Water Act rules.

Prevailing winds are from the southwest to northeast, therefore, the air contaminants from the Pocatello and Idaho Falls area will generally not contribute to cumulative impacts within the study area.

Current Air Quality in the Study Area

A search for current ambient air quality data was performed. Recent data for PM-10 (particulate with an equivalent aerodynamic diameter of 10 microns), TSP (total suspended particulate) and SO₂ (sulfur dioxide) were found. The study area is classified as attainment for all criteria pollutants by the Idaho Department of Environmental Quality and the Environmental Protection

Agency (EPA). An attainment area is an area in which the ambient concentrations of criteria pollutants are within the limits of the National Ambient Air Quality Standards (NAAQS).

Air quality data were collected by the Idaho Department of Health and Welfare. Most of the data sites are 12 to 25 miles and west and northwest of the proposed lease tracts. The following tables (Table 3-15 through Table 3-17) summarize the data collected in the near-by area.

Table 3-15 PM-10 Ambient Air Quality Data Values in ug/m³
(ug/m³ = micrograms per cubic meter)

| Site | City | UTM Coordinates | Year | Annual Average | 24 hour Max. | Number of Exceedance |
|---------------------------|--------------|-----------------------|------|----------------|--------------|----------------------|
| (Norton) State Highway 34 | Soda Springs | 4724120 N 452198 E | 1995 | 20.1 | 73 | 0 |
| (Norton) State Highway 34 | Soda Springs | 4724120 N 452198 E | 1994 | 25.4 | 80 | 0 |
| (Norton) State Highway 34 | Soda Springs | 4724120 N 452198 E | 1993 | 24.9 | 55 | 0 |
| (Norton) State Highway 34 | Soda Springs | 4724120 N 452198 E | 1992 | 31.6 | 153 | 1 |
| (Norton) State Highway 34 | Soda Springs | 4724120 N 452198 E | 1991 | 24.9 | 59 | 0 |
| (Norton) State Highway 34 | Soda Springs | 4724120 N 452198 E | 1990 | 26.8 | 96 | 0 |

Table 3-16 Total Suspended Particulates (TSP) Ambient Air Quality Data

| Site | City | Site | Year | Annual Average (ug/m ³) | 24 hour Max. (ug/m ³) | Number of Exceedance |
|--|----------------|-----------------------|------|-------------------------------------|-----------------------------------|----------------------|
| 1.2 mile E of State 34 | Caribou County | 4731024 N 454756 E | 1988 | 117 | 499 | 14 |
| 1.2 mile E of State 34 | Caribou County | 4731024 N 454756 E | 1987 | 50 | 404 | 8 |
| 2 miles N of Hooper Springs on County Location-Setting (3) | Caribou County | 4728714 N 449762 E | 1988 | 38 | 122 | 0 |
| 2 miles N of Hooper Springs on County Location-Setting (3) | Caribou County | 4728714 N 449762 E | 1987 | 25 | 92 | 0 |
| 2 miles N of Hooper Springs on County Location-Setting (3) | Caribou County | 4728714 N 449762 E | 1987 | 25 | 99 | 0 |
| 2 miles N of Hooper Springs on County Location-Setting (3) | Caribou County | 4728714 N 449762 E | 1986 | 20 | 99 | 0 |

Table 3-16 Continued

| Site | City | Site | Year | Annual Average (ug/m ³) | 24 hour Max. (ug/m ³) | Number of Exceedance |
|--|----------------|-----------------------|------|--|--------------------------------------|----------------------|
| 2 miles N of Hooper Springs on County Location-Setting (3) | Caribou County | 4728714 N 449762 E | 1985 | 26 | 123 | 0 |
| Conda RD/1.2 miles E of State 34 | Soda Springs | 4731024 N 454756 E | 1990 | 33.3 | 109 | 0 |
| Conda RD/1.2 miles E of State 34 | Soda Springs | 4731024 N 454756 E | 1987 | 50 | 404 | 8 |
| Conda RD/1.2 miles E of State 34 | Caribou County | 4731024 N 454756 E | 1986 | 48 | 256 | 8 |
| Conda RD/1.2 miles E of State 34 | Soda Springs | 4731024 N 454756 E | 1985 | 88 | 486 | 13 |
| Harris Ranch, S of Monsanto | Caribou County | 4724809 N 451523 E | 1988 | 47 | 133 | 0 |
| Harris Ranch, S of Monsanto | Caribou County | 4724809 N 451523 E | 1987 | 51 | 305 | 7 |
| Harris Ranch, S of Monsanto | Caribou County | 4724809 N 451523 E | 1987 | 51 | 305 | 7 |
| Harris Ranch, S. of Monsanto | Caribou County | 4724809 N 451523 E | 1986 | 32 | 147 | 0 |
| Harris Ranch, S. of Monsanto | Caribou County | 4724809 N 451523 E | 1985 | 51 | 192 | 1 |
| Richard Torgeson Residence (Conda) | Caribou County | 4732300 N 454000 E | 1987 | 30 | 108 | 0 |
| Richard Torgeson Residence (Conda) | Caribou County | 4732300 N 454000 E | 1986 | 25 | 143 | 0 |
| Richard Torgeson Residence (Conda) | Caribou County | 4732300 N 454000 E | 1985 | 36 | 276 | 1 |
| Soda Springs Hospital | Caribou County | 4722283 N 450250 E | 1988 | 51 | 115 | 0 |
| Soda Springs Hospital | Caribou County | 4722283 N 450250 E | 1987 | 36 | 102 | 0 |
| Soda Springs Hospital | Caribou County | 4722283 N 450250 E | 1987 | 36 | 102 | 0 |
| Soda Springs Hospital | Caribou County | 4722283 N 450250 E | 1986 | 29 | 91 | 0 |
| Soda Springs Hospital | Caribou County | 4722283 N 450250 E | 1985 | 38 | 106 | 0 |

Sulphur Dioxide (SO₂) Data

This data has been included to present a more complete picture of the current air quality of the study area. The potential mining operations will have relatively low SO₂ emission rates and very small impacts on SO₂ ambient concentrations. The NAAQS for SO₂ are 80 micrograms per cubic meter annual average, 365 micrograms per cubic meter 24 hour average, and 1,300 micrograms per cubic meter 3 hour average. The highest three hour average concentration was 146, well below the 1,300 limit. The highest 24 hour average was 61 as compared to the standard of 365. And the annual average of 23 was well below the standard of 80.

Table 3-17 SO₂ Ambient Air Quality Data

| Site | City | UTM Coordinates | Year | Annual Average (ug/m ³) | Max. (ug/m ³) | Number of Exceedance |
|--|-------------|-----------------------|------|-------------------------------------|---------------------------|----------------------|
| 1.2 mile E of State 34 (annual average.) | Soda Spring | 4731024 N 454756 E | 1988 | 23 | | 0 |
| 1.2 mile E of State 34 (24 hr max.) | Soda Spring | 4731024 N 454756 E | 1987 | | 61 | 0 |
| 1.2 mile E of State 34 (3 hr max.) | Soda Spring | 4731024 N 454756 E | 1987 | | 146 | 0 |

Particulate Data

For purposes of reviewing the air quality impact of new or modified sources of air contaminants, the Idaho DEQ assumes the ambient concentrations of PM-10 in the study area to be 85 ug/m³ (24 hr average) and 30 ug/m³ (annual average) (Johnson, 1995b). The NAAQS 24-hour and annual standards are 150 and 50 ug/m³ respectively. Six years (1990 through 1995) of PM-10 ambient air quality data have been collected at the Soda Springs location. For all six years, the annual average concentration has been roughly half of the NAAQS standard. There is one 24 hour average concentration that exceeds the NAAQS, in 1992. Each of the other years saw maximum 24 hour concentrations roughly one half of the standard.

Data on TSP (Total Suspended Particulate) has been included for historical interest only. The TSP ambient air quality standard was replaced in 1990 with the PM-10 standard.

Estimates of ambient concentrations for air contaminants other than PM-10 were not provided by the Idaho DEQ. Since the study area is rural and there are not many industrial emission sources or large numbers of automobiles in the area, it can be assumed that ambient concentrations of air contaminants other than PM-10 are low.

Fluorine Data

Fluorine is found in varying quantities in the phosphate rock. Fluorine compounds are emitted during the refining operations and through dust emissions at the mining site. Untreated fluorides are released into the atmosphere in the form of particulates, liquids, and gases. The most common forms are silicon tetrafluoride, hydrogen fluoride, and fluorosilicic acid. These compounds can cause ambient concentrations of fluorides to increase. There is no data on the background concentration of fluorides in the ambient air in the study area (USDA & USDI, 1981, pgs. 1-37 to 1-140). However, studies have been done on vegetation in the area. These studies do not imply that there are currently high concentrations of fluorides in the area.

The state of Idaho has a vegetation standard for fluorides (Johnson, 1995c). The standards for animal forage are as follows:

- 40 ppm annual average
- 60 ppm bimonthly average
- 80 ppm monthly average

There are two main fluoride sources in the Pocatello area which are 63 miles west of the study area. They are the J. R. Simplot fertilizer plant and the FMC phosphorus plant. There are also two plants in Soda Springs. The fluoride emissions are mainly from the volatile fluoride compounds remaining in the waste ponds (USDI-USGS, BLM, and USDA Forest Service, 1977, pg 1-137). The emissions of fluorides from these plants are not reported in their inventories as fluorides; they are included as particulate emissions.

Existing Sources

The following table (Table 3-18) identifies emissions from existing sources located within Bear Lake and Caribou Counties. Depending on the quantity of the emissions and distance each emission source is located from the study area, some of the existing sources could have a cumulative effect with emissions from the potential or existing mines. It is also likely that there are other sources in the area that are not in Idaho Division of Environmental Quality's inventory.

Table 3-18 Existing Emissions and Sources in Tons per Year

| Source | County | CO | NOx | Particulate | SO2 | VOC |
|-----------------------------------|-----------|---------|---------|-------------|---------|-------|
| NW Pipeline Compress Station | Bear Lake | 57.10 | 451.60 | -- | -- | 19.60 |
| NW Pipeline Compress Station | Bear Lake | 22.38 | 73.12 | -- | -- | 1.68 |
| Chemstar Lime Quarry | Caribou | 10.10 | 32.70 | 88.10 | 5.50 | 0.00 |
| Conda Phosphate Mine | Caribou | -- | -- | 577.85 | -- | -- |
| Kerr McGee Vanadium Chemicals | Caribou | 4.80 | 23.99 | 0.16 | 91.80 | 1.30 |
| Le Grand Johnson Concrete Plant | Caribou | 0.68 | 1.73 | 0.61 | 0.14 | 0.15 |
| Monsanto Phosphate Mine | Caribou | -- | -- | 580.65 | -- | -- |
| Monsanto Chemical Plant | Caribou | 1771.59 | 2021.20 | 1214.14 | 4702.64 | 0.17 |
| Nu-West Phosphate Fertilizer | Caribou | -- | -- | 265.70 | 4369.00 | -- |
| Soda Springs Phosphate Fertilizer | Caribou | 0.12 | 0.61 | 59.25 | 0.00 | 0.04 |

Notes: CO = carbon monoxide NOx = oxides of nitrogen SO2 = sulphur dioxide
VOC = volatile organic compounds

VISUAL RESOURCES

This section describes the existing environment of visual resources as they relate to Issue 2.

Issue 2 The effects of phosphate leasing and subsequent exploration, mining, and development activities on backcountry recreation and hunting opportunities and experiences.

Scope of Analysis

The landscapes of the Caribou National Forest have been classified by scenic quality, sensitivity level, and the distance from which they are seen. Scenic quality is measured by describing landscapes as distinctive, common, or minimal. Sensitivity is categorized as low, moderate, or high. The sensitivity level of a view is determined by the viewing point, the number of viewers, and the duration of viewing. The viewing distance is broken down into foreground, middleground, or background.

This system is used to determine visual quality objectives (VQO's) for the landscapes of the Forest. VQO's provide a standard for scenery management. Each VQO describes a different amount of acceptable change or alteration of the scenery.

The scenery of the study area was assessed by a site overview and VQO maps from the Forest Planning Records in the Forest Supervisors' office (Figures 3-20 and 3-21).

General Description and Background

The study area is located within the Middle Rocky Mountains Physiographic Province. This province is characterized by north and northwest trending mountain ranges and valleys. This study area is within the Webster, Aspen, and Pruess Range portion of the Rocky Mountain Chain.

The mountain ranges are separated by narrow to wide valleys that end in flat to undulating plateaus. Although these valleys offer little variety themselves, they do add contrast and character to the rolling hills and mountains in presenting a general theme of the open western rangelands.

The scenic quality of these low mountain ranges is typical or common to the area as opposed to a landscape of distinctive scenic quality. The study area consists of mountains, foothills, mountain valleys, and river plain lands accented by occasional rock formations and a variety of vegetative types. Rugged mountains or wild and scenic rivers are not found within the immediate area, but the existing aesthetic values do provide an important scenic resource. The most common landform in the area is the foothills. Manmade intrusions within the area currently have an impact on the aesthetic environment (USDI - USGS, BLM, & USDA Forest Service, 1977, pg.1-264).

The lower slopes are covered with grasses, aspen and mountain brush. The upper slopes have a mix of mature lodgepole pine, Douglas-fir, and other conifers. The pattern of conifer stands is intermittent and variable. The landscape can absorb vegetation changes if new openings in the tree canopy mimic natural openings in shape and scale.

The proposed Manning Creek Tract is located in a relatively undeveloped mountainous area. Disturbance by man is limited to recent phosphate exploration activities and grazing. Most of the Manning Creek Tract is not readily visible from public roads such as Crow Creek, Diamond Creek, or Sage Creek roads. The trail up Deer Creek Canyon is located in the drainage immediately south of the proposed lease tract. The trail up the North Fork of Deer Creek goes through potential mine areas. Portions of the access road may be seen from the Sage Valley area; however, there are no public roads located in Sage Valley (USDA Forest Service and USDI BLM, 1992, pg.20).

The proposed Dairy Syncline Tract area contains evidence of manmade disturbances. The enclosed basins are rural and pastoral with evidence of timber sales and livestock grazing. Slopes throughout the area are usually less than 40 percent but range up to 60 percent or greater in some areas. The valley floors are relatively flat and treeless. Rock outcrops are frequently found along open ridges and on south and west aspect slopes. Vistas of Slug Creek are found along the edges of the mountains. Most roads are accessible only by 4-wheel drive vehicles (USDA Forest Service, 1989, pgs. 4-9 & 4-10).

Manmade intrusions within the Dairy Syncline Tract portion of the study area cause varying impacts on the land. These intrusions are primarily roads, fenced livestock-grazing allotments, and logged areas. Within major valley bottomlands, impacts are more acceptable because they are

less visible on the flat terrain, and man's activities are expected there. Activities that take place on steeper slopes are more visible for greater distances. Because of the natural character of the area, manmade impacts could cause greater visual impacts.

Inventory Results

A visual resource inventory of Variety Class, Visual Sensitivity, Distance Zone (visibility), and Visual Quality Objectives for the study area was conducted using the methodologies and guidelines of the Forest Service Visual Management System (VMS) (USDA Forest Service, 1974). The purpose of this inventory was to establish and document the existing visual qualities of the study area.

Variety Class

Class A (distinctive) landscapes occur in higher mountain and steeper ridge areas with abundant coniferous trees, meadows, and wild flowers. These distinctive areas (Class A) include 235 acres in the upper reaches of Timber Creek north of the Manning Creek Tract and Diamond Creek west of the Manning Creek Tract. The remainder of the Manning Creek study area is Variety Class B.

Most of the Dairy Syncline portion of the study area is Variety Class B with a few acres of Variety Class C located south and southeast of the proposed lease tract. These Variety Classes are shown on the Visual Quality Objective maps (Figures 3-20 and 3-21).

Sensitivity Level/Distance Zone

Rattlesnake Basin, located in the southwest part of the Dairy Syncline study area, is Sensitivity Level 1. The remainder of the study area, for both proposed lease tracts, is Sensitivity Level 2.

Twenty-five (25) acres of the Manning Creek Tract is foreground and the remaining portion of the Tract is middleground. Diamond Creek and Crow Creek drainages are foreground distance zones.

Most of the proposed Dairy Syncline lease Tract is middleground distance zone. About 185 acres on the eastern edge of the tract and the Slug Creek drainage is foreground.

Visual Quality Objectives (VQO's)

The VQO inventory results were derived from the Forest Planning Records of the Caribou National Forest. The study area contains two VQOs described below and displayed on the Visual Quality Objective Map (Figures 3-20 & 3-21).

Partial Retention - Provides for management activities that are "visually subordinate" within the characteristic landscape. Under Partial Retention, activities may repeat form, line, color, and texture found in the characteristic landscape. Activities may also introduce form, line, color, and texture found infrequently in the characteristic landscape, but these activities must remain subordinate to the visual strength of the characteristic landscape.

There are three areas of Partial Retention within the Manning Creek portion of the study area. These are Diamond Creek, the upper reaches of Timber Creek, and Crow Creek. Only 235 acres of the proposed lease tract are Partial Retention. However, several hundred acres could be involved with construction of potential transportation and surface facilities.

There are two areas of Partial Retention within the Dairy Syncline portion of the study area. These areas are Rattlesnake Basin and Slug Creek. Only 185 acres of the proposed lease tract are Partial Retention. However, several hundred acres could be involved with construction of potential transportation and surface facilities.

Modification - Provides for management of activities that are "visually dominate" within the characteristic landscape. Under Modification VQO, activities may repeat and introduce form, line, color, and texture found in the characteristic landscape. However, activities of vegetative and landform alteration must borrow from naturally established form, line, color, and texture so completely and at such a scale that their visual characteristics are those of natural occurrences within the characteristic landscape.

There are three areas of Modification in the study area. These areas are viewed in the middleground (1/2 - 3 to 5 miles) from Sensitivity Level 2 views. These areas are Big Basin and most of the Dairy Syncline Tract. Most of the Manning Creek Tract is Modification. The upper reaches of Timber Creek are also Modification.

SOIL RESOURCES

This section describes the existing environment as it relates to Issue 4.

Issue 4 - The effects proposed phosphate leasing and subsequent exploration, mining, and development activities on wetlands, riparian areas, water quality, and fisheries in the Salt and Blackfoot River drainages.

Introduction

The Forest Plan, Standards and Guidelines state, "Because of the small mapping scale used in the Forest planning process, select pockets of land within the land types classified as not capable of sustaining intensive management activities may meet the criteria for such use; the reverse also may be true. If such conditions exist, each must be considered on a case-by-case basis. Potential projects must be within the constraints for capability, suitability, compatibility, and feasibility established in the Plan."

The Soil Survey of the Caribou National Forest, Idaho, 1990, provides generalized and detailed information for the planning area. Excerpts from this report are used below.

Existing sediment production or yield estimates (tons/year) from the lease tract area are discussed in Chapter 4 (Tables 4-35 and 4-36). Existing sediment rates vary between 3.4 and 22.8 tons/year depending on the specific area considered. These data are presented in Chapter 4 for comparison purposes.

The two areas, Dairy Syncline (west portion) and Manning Creek (east portion), share similar soils, parent materials, and climate. The soils have developed in the Middle Rocky Mountain Province typified by two major landforms: 1) The heavily forested Yellowstone Plateau of volcanic origin north of the project area, and 2) the complexly folded and faulted ranges. The second grouping characterizes the landforms encompassed in the areas of concern. The mountains are characterized by tight to open folded Paleozoic and Mesozoic Era sedimentary rocks. Elevations of peaks range from about 7,000 to 8,700 feet and the valleys between the ranges are generally more than a mile above sea level. Major drainages parallel the mountain ranges and trend northwest toward the Snake River.

Drainage dissection within the two areas has been described as weak to strongly dissected. Slope distances range from 200 to as much as 3,000 feet in length. They also exhibit a wide range of landforms from gently sloping benches or depressions to convex-concave and steep canyon sidewalls. The topography is quite variable over short distances.

General Description

Manning Creek Tract

The Manning Creek Tract is arranged in a southwest to northeast direction. South Fork Sage Creek, which drains to the east, bisects the north end with drainage systems coming from the north and south. The land is generally steep with several pronounced benches interrupting the slopes. The general slopes are moderately dissected with slight to strongly incised drainage ways. The strongest relief is at the north end where elevation ranges from 6,800 in Sage Creek to 8,365 at the ridge system within 3,500 ft. horizontal distance.

The southern portion is drained by Manning Creek (which drains eastward), the North Fork Deer Creek (draining southerly), and Deer Creek which also drains easterly. The relief of the study area is broken in a stair-step manner with ridges at over 8,600 ft immediately west of the study boundary to ridges of 8,300 ft within the area. The northeast trending ridge system has low benches on the west face, moderately steep and steep slopes grading to prominent benches, and another series of steep slopes on the east face.

The Manning Creek watershed is bounded by two saddles and includes steep slopes and a basin perpendicular to the saddles. The North Fork includes valley fill bounded by moderately steep, dissected and strongly incised mountain side slopes. Deer Creek, with a relatively wide valley fill, is bounded by steep to very steep, moderate to highly dissected, and moderately incised side slopes.

There is strong evidence of major faulting and dipping of the underlying strata. The landforms include: canyon sidewalls, moderate to steep upland mountain slopes, benches, headwall/basin (Manning Creek), narrow and broken (discontinuous) ridge-tops, and valley fill, particularly in South Fork Sage, Deer, and North Fork Deer Creeks.

Dairy Syncline Tract

The Dairy Syncline Tract is aligned in a northwest to southeast direction. Surface drainage is to the northeast and east. The northern portion is characterized by steep, moderate to strongly dissected, deeply incised, uneven mountain slopes. Elevation ranges from 6,600 to slightly over 7,600 feet in about 2,500 feet horizontal distance in the steepest portion.

The middle portion is dominated by Green Basin with drainage systems entering from all compass aspects. The adjacent mountain slopes are also steep and uneven, slightly dissected and deeply incised. The elevations range from 6,800 to 7,500 ft.

The southern and smallest portion drains mostly northward into a tributary to Slug Creek. Slopes in this area are slightly dissected and deeply incised. Elevation ranges from 6,600 to 7,500 ft.

Climate and Precipitation

During winter, persistent west winds bring mild weather into the area from the Pacific Coast, but for periods of several days, temperatures stay well below 0 degrees Fahrenheit. Cloudy and unsettled weather prevails throughout the winter with measurable precipitation on about one-third of the days. Snow prevails on the hills and mountains during winter months. The weather warms gradually in the spring. Freezing often persists at night until May at the lower elevations because of radiational cooling. Frost hazard persists all summer at the higher elevations. Normally, spring months are the wettest and windiest. Cool nights and warm to hot days are common during

summer. Precipitation in summer is limited to localized showers. The summer showers are gradually replaced by unsettled weather and more general rain. General snowcover usually begins in November or December.

Quantity, timing, and type of precipitation vary considerably over the area. In general, precipitation increases with elevation, but steepness and direction of slopes, orientation, height of ridge-tops, direction of prevailing winds, and other features also exert considerable control over the amount of precipitation. Most of the area has an annual precipitation of 25 to 35 inches, chiefly in the form of snow.

Habitat Types

Similar sites or units of land that potentially support the same climax vegetation may logically be classified together and are called Habitat Types (Daubenmire, 1968; Steele et.al., 1983). Habitat types are named after the climax overstory and diagnostic undergrowth species in the belief that the climax plant community reflects a meaningful integration of environmental factors influencing vegetation. Even though plant names are used, the types within the classification are units of land (or partitions of the physical environment). Habitat types were identified for the following soil mapping units (Figures 3-22 and 3-23).

Habitat Type Group 4

This habitat type group occurs at low to mid-elevations, on gently to moderately sloping low relief, toe slopes, some alluvial-colluvial fans, canyons, and foothills. These east, west, north and south-facing slopes support predominantly big sagebrush rangeland vegetation on deep, well-drained soils with interspersed aspen and mixed conifer-aspen stands. This group includes Soil Mapping Unit 301, (Manning Creek and Dairy Syncline areas, Figures 3-22 and 3-23).

Habitat Type Group 5

This habitat type group occurs at low to mid-elevations on moderately sloping to very steep mountain side slopes, canyons, foothills, and some alluvial-colluvial fans. These south and east-facing slopes support predominantly big sagebrush rangeland vegetation with interspersed aspen and mixed conifer-aspen stands. This group includes Soil Mapping Unit 553 (Manning Creek area, Figure 3-22).

Habitat Type Group 7

This habitat type group occurs from low to mid-elevations on moderately sloping to steep mountain side slopes, canyon side slopes and foothills with rocky areas and rock outcrops. These dry south and west-facing slopes support a vegetation mosaic consisting of mountain shrub interspersed with conifer and mountain brush. Stands of mountain mahogany occur on the steep, south-facing slopes. Various sagebrush habitat types occur below the mountain mahogany stands on less rocky substrates. This group is common and includes Soil Mapping Unit 405 (Manning Creek area, Figure 3-22).

Habitat Type Group 9

This habitat type group occurs at low to mid-elevations on various landforms including weakly dissected unstable side slopes; fluvially worked moderately steep to steep slumpy and broken side slopes; rolling foothills; moderately dissected, faulted, scarp and dip valley; mountain side slopes and gently sloping to moderately sloping, slightly concave toeslopes; fans, and coalescing fan complexes. Many seeps and springs are present in the valley bottoms and on side slopes. The common feature of this group is the concave fluvial side slopes that support a mosaic of vegetation consisting of aspen stands interspersed with mountain shrub and conifer. The Soil Mapping Units are: 300, 380, 381, 651, & 656 (Manning Creek and Dairy Syncline areas, Figures 3-22 and 3-23).

Habitat Type Group 10

This habitat type group occurs on low to mid-elevations, moderately steep to very steep canyon walls, and broken mountain side slopes. Common features are the steep, warm, and dry slopes that support a mosaic of predominantly coniferous forests and aspen stands. The group also includes steep, relatively dry south-facing slopes supporting a mixture of rangeland types in close proximity. Rock outcrops are present in all map units. It includes Soil Mapping Units 473 (Dairy Syncline and Manning Creek areas, Figures 3-22 and 3-23).

Habitat Type Group 11

This habitat type group occurs at low to mid-elevations, on moderately sloping to steep foothills, and broken mountain side slopes that support predominantly coniferous forests. It includes aspen stands and non-forest communities. Forested sites belong to a variety of habitat types, but most are relatively warm and dry extremes of the subalpine fir series. This group includes Soil Mapping Units 300, 404, & 755 (Dairy Syncline and Manning Creek areas).

Habitat Type Group 12

This habitat type group occurs on mid to upper elevation slopes in the subalpine fir zone. Sites are steep mountain slopes that support predominantly coniferous forest but also include aspen stands and non-forest communities. Forested sites belong to a variety of habitat types; most are relatively warm and dry extremes of the subalpine fir series. This group includes Soil Mapping Unit 653 (Dairy Syncline area).

Table 3-19 - Soil Mapping Unit and Percentage of Total Area

| Manning Creek Tract | | Dairy Syncline Tract | |
|---------------------|--------------------|----------------------|--------------------|
| Soil Mapping Unit | Percentage of Area | Soil Mapping Unit | Percentage of Area |
| 300 | <1 | 300 | 11 |
| 301 | 19 | 301 | 18 |
| 380 | 14 | 380 | 29 |
| 381 | 21 | 473 | 11 |
| 404 | 8 | 651 | 3 |
| 405 | 8 | 653 | 9 |
| 473 | <1 | 656 | 19 |
| 553 | 20 | | |
| 755 | 9 | | |

Soil Mapping Units (SMU)

Within the the boundaries of the Dairy Syncline and Manning Creek areas, the following soil mapping units were identified (Figures 3-22 and 3-23).

Approximate percentages of the total areas are displayed in Table 3-19.

Manning Creek Tract SMU General Locations

North end - SMU 553 is moderately dissected and benchy. SMU 755 is moderately dissected and strongly incised. Relief range is about 725 feet in 1,800 feet horizontal distance. SMU 301 is smooth to moderately dissected with deeply incised drainages. Elevation

ranges from 7,200 to 8,200 feet. There is a pronounced ridge system with some benches. SMU 380 ranges in elevation from 6,900 to 7,600 feet and has moderate dissection with moderate incision.

South end - SMU 381, the lower portion is benchy, deeply incised with moderate dissection. It also includes headwall/basin of Manning Creek. Elevation in North Fork Deer Creek ranges from 6,900 to 8,300 feet in 5,000 feet horizontal distance. The upper portion has broad slopes, slightly dissected with moderate to deep-incision. SMU 553 has also been mapped and is in the southwest portion, is steep, moderately dissected, and deeply incised. Another portion has broad, open slopes. Of slightly less extent is SMU 405. It is highly dissected and slightly incised. SMU 404 also occurs and can be found on moderately dissected, slightly incised slopes.

Dairy Syncline Tract SMU General Locations

Soil Mapping Unit (SMU) 380 is found on irregular slopes with Green Basin in the middle. It is moderately dissected and deeply incised. SMU 301 is found on irregular slopes with moderate to strong dissection and deeply incised drainage ways. SMU 473 occurs on a ridge system with drainages to the west, east, and some to the north. SMU 300, which is minor in extent, is a ridge system with smooth slopes and drainage to the west and northeast. SMU 653, also minor in extent, has moderate dissection and strongly incised drainage ways. SMU 656 occurs on a ridge top and drains mostly to the northeast. It is slightly to moderately dissected with moderate to strong incision. Relief ranges about 400 feet in 2,000 feet horizontal distance. SMU 651, which is very minor, occurs on irregular mountain slopes with moderate dissection and moderate incision. The lowest point is 6,600 feet and the highest is about 7,800 feet.

Erosion Hazard Rating

In view of the various activities proposed on these lands, surface erosion, as well as mass stability of lands, are a major concern. Found in the Forest Service Soil Survey report are erosion ratings based on bare ground conditions that assume removal of vegetation and litter with the natural soil horizons remaining intact. Ratings are based on properties that affect soil movement from overland flow including slope, infiltration rate, subsoil permeability, and surface coarse fragments. Soils on steep slopes with few coarse fragments and slow infiltration and/or permeability rates are highly erodible. A rating of MODERATE indicates that some loss of soil materials is expected. Rill erosion and some small gullies or sheet erosion may occur. A rating of HIGH indicates that excessive loss of soil material can be expected. Significant reduction in productivity may result.

For example, the Povey soil family is one of the more common soils encountered in both areas. It is found in Mapping Units 380, 405, 473, and 651. These soils support aspen and are deep and well drained. They frequently occur on moderately steep to steep south facing, scarp-dip side slopes. The dip-slopes range from 400 to 1,200 feet, and longer, than the scarp slopes. Most of the slopes are concave in shape and range from 20 to 60 percent. Permeability is moderate. Parent materials are residuum from sandstone, shale, and siltstone mainly of the Wells and Phosphoria Formations. The surface is usually covered with an inch of forest duff and litter. The mineral soil is very dark, grayish-brown loam, about 13 inches thick. The underlying "leached" horizon is about 8 inches thick and very dark, grayish-brown very gravelly loam. The upper subsoil is very dark, grayish-brown gravelly loam, and is about 8 inches thick. The lower subsoil is dark, grayish-brown very gravelly loam, and is about 20 inches thick.

The Povey soils are rated as moderately high for forage production with moderate revegetation limitations. Timber production potential is also moderate with cold conditions as a major limitation to regeneration. The mass movement potential is classed as stable to marginally stable and varies by the position it occupies within the landforms. Surface erosion hazard rating also

varies from low (SMU 066) to moderate (SMU's 380, 405, 553, and 651) to high (SMU'S 473 and 912).

Soil Stability and Hazard Ratings

Soil stability and hazard rating are summarized in Table 3-20, for the Soil Map Units within the study area. Mass Stability, Erosion Hazard, Cut Slope Stability Hazard ratings, Revegetation Limitations, and Percent of Slope are considered important factors in determining stipulations and mitigation measures. A discussion of the definitions is presented prior to the summary of ratings (Table 3-20).

Mass Stability Ratings are based on recency of past landslide activity and characteristics of lands that determine the probability of mass movement. Road construction can contribute to accelerated movement. A rating of **unstable** indicates that the site is actively moving, and probabilities of increased or additional movement, even without man-caused disturbance, is high. A rating of **marginally unstable** indicates that evidence of past movement exists but no current movement is discernable. Disturbance at critical locations or in amounts beyond critical limits may reactivate mass movements. A rating of **marginally stable** indicates that evidence of past mass movement has not been discerned, but there are land characteristics which are conducive to mass movement. On-site evaluation and mitigation measures may make activity on these sites feasible without initiating mass movement. A rating of **stable** indicates that evidence of past mass movement is not discernable and land characteristics are not conducive to future mass movement.

Erosion Hazard for bare ground ratings assume removal of vegetation and litter and that the natural soils horizons remain intact. Ratings are based on properties which affect soil movement with overland flow including slope, infiltration rate, subsoil permeability, and surface coarse fragments. Soils on steep slopes with few coarse fragments and slow infiltration and/or permeability rates are highly erosive. A rating of **low** indicates that little or no significant loss of soil materials is expected. A rating of **moderate** indicates that some loss of soil materials is expected. Rill erosion and some small gullies or sheet erosion may occur. A rating of **high** indicates that excessive loss of soil material can be expected. Significant reduction in productivity may result.

Cut and Fill Revegetation Limitations ratings assume uniform slopes with one-to-one grade and seeding completed during the first growing season following construction. The ratings are based on properties affecting the establishment of grasses. These properties include mass stability, drainage, coarse fragments, texture, depth to bedrock, and slope. Soils that are shallow, rocky, unstable, or wet on steep slopes have severe limitations for establishing vegetation. A rating of **slight** indicates that an acceptable response can be expected in the first year following revegetation. A rating of **moderate** indicates that limited response can be expected the first year following revegetation. More than one year may be needed to establish acceptable cover. A

rating of severe indicates that a slow response can be expected. Special erosion control practices may be needed and several years will be required to establish acceptable cover.

Cut slopes Stability Hazard ratings assume construction on uniform slopes with cuts greater than five feet high, a one-to-one final grade, and revegetation following construction. The ratings are based on soil properties affecting stability of mechanically disturbed slopes. These include mass stability, texture, drainage, and slope. Wet soils with uniform particle size on steep, naturally unstable slopes have the highest hazard. A rating of low indicates that no appreciable hazard of mass failure on cut and fill slopes exists. A rating of moderate indicates that seasonal repair of roads would be needed because of mass failure on cut and fill slopes. A rating of high indicates that cuts and fills would yield excessively high volumes of material from mass failures. Constant repair of roads is required.

Table 3-20 Soil Stability and Hazard Rating by Soil Map Unit

| Soil Map Unit Family | Percent Slope | Mass Stability Rating | Erosion Hazard Rating | Cut and Fill Revegetation Limitations | Cutslope Stability Hazard Rating |
|--|---------------|---|----------------------------------|---------------------------------------|----------------------------------|
| 066 Red Spur Family Povey Family Dranyon Family | 0 to 10 | Stable Stable Stable | Low Low Low | Slight Slight Slight | Low Low Low |
| 082 Rooset Family Beaverdam Family Toone Family | 10 to 20 | Marginally Unstable Marginally Unstable Marginally Unstable | Moderate High Moderate | Moderate Moderate Moderate | Low Moderate Low |
| 300 Ericson Family Cloud Peak Family Ketchum Family | 15 to 50 | Marginally Unstable Marginally Unstable Stable | Moderate Moderate Moderate | Moderate Slight Slight | Moderate Moderate Low |
| 301 Blaine Family Dranyon Family | 15 to 40 | Stable Stable | Moderate Moderate | Moderate Moderate | Low Low |
| 380 Povey Family Alpon Family Ketchum Family | 30 to 55 | Stable Stable Stable | Moderate Moderate High | Slight Slight Severe | Low Moderate Low |
| 381 Parkay Family Judkins Family Farlow Family | 30 to 55 | Stable Stable Stable | Moderate Moderate Moderate | Slight Severe Slight | Low Low Low |
| 473 Dranyon Family Judkins Family Povey Family | 30 to 50 | Marginally Stable Marginally Stable Marginally Stable | Moderate High High | Severe Moderate Moderate | Moderate Moderate Low |
| 551 Judkins Family Cloud Peak Family Farlow Family | 30 to 50 | Stable Stable Stable | Moderate Moderate High | Moderate Severe Slight | Low Low Low |
| 553 Blaine Family Nisula Family | 40 to 65 | Stable Stable | Moderate High | Moderate Severe | Low Moderate |

Table 3-20 Continued

| Soil Map Unit Family | Percent Slope | Mass Stability Rating | Erosion Hazard Rating | Cut and Fill Revegetation Limitations | Cutslope Stability Hazard Rating |
|--|---------------|---------------------------------------|----------------------------------|---------------------------------------|----------------------------------|
| 653 Judkins Family Nisula Family Farlow Family | 40 to 60 | Stable Stable Stable | Moderate Moderate Moderate | Severe Severe Moderate | Low Moderate Low |
| 656 Cloud Peak Family Jughandle Family Swede Family | 30 to 50 | Stable Marginally Stable Stable | Moderate High Moderate | Severe Moderate Moderate | Low Low Moderate |
| 755 Ketchum Family Nisula Family Farlow Family | 25 to 45 | Stable Stable Stable | High Moderate Moderate | Severe Severe Moderate | Low Moderate Low |
| 913 Farlow Family Parkay Family | 30 to 70 | Stable Stable | High Moderate | Severe Moderate | Low Low |

MINERAL/GEOLOGY RESOURCES

Introduction

According to the USDI, (1994), 45.3 million tons of ore grade phosphate rock were mined in the United States by domestic producers in 1994 (Socioeconomic section). Of that total, about 5.9 million tons were produced in the western phosphate fields of which Idaho, Wyoming, Montana, and Utah contain the only economic phosphate deposits. The annual production has increased steadily since 1986 and the 5.9 million tons is the highest production year to date.

Large phosphate mines are at present operating in Idaho and Utah. Idaho is known to have the greatest concentration of minable phosphate in the western fields. U.S. Geologic Survey Circular 888, Phosphate Rock Resources of the United States, estimates 1.038 billion tons of phosphate rock in Idaho, but because of geologic structure and depth, only a fraction would be recoverable by open pit mining methods.

Depletion of the deposits historically mined in North Carolina and Tennessee shifted some additional demand to Florida, the western phosphate fields of the United States, and to imported phosphate rock from Morocco. Environmental conditions and the depletion of reserves in Florida is expected to continue to shift the demand for phosphate either to foreign deposits or to the western U.S. in the future (Stowasser, W.F., 1991).

In the western phosphate field, economic grades of phosphate ore are found in the Permian-age Meade Peak Member of the Phosphoria Formation. Deposition of this deposit is believed to have occurred as upwelling deep ocean currents concentrated the phosphate in organic rich sediments as carbonaceous shales and muds in shallow marine environments.

Later, low angle tectonic forces folded the strata of eastern Idaho and western Wyoming into northwest-southeast trending ridges and thrust faulted plates. Expansion of the compressed western North American continent resulted in normal faulting of the basin and range that extended into part of the previously formed overthrust belt. What remains after millions of years of erosion is the present topography revealing outcrops of the Phosphoria Formation appearing as generally northwest-southeast trending outcrops that parallel the ridges and valleys of southeast Idaho.

Apatite in microcrystalline form, referred to as collophane, is the phosphorus-containing mineral sought after by phosphate miners in the western phosphate fields. Phosphorite is the assemblage of pelletal phosphatic minerals, calcium carbonate rocks, mudstones, and shales that are mined.

Stratigraphically, the Phosphoria Formation underlies the Triassic Dinwoody Formation and overlies the Pennsylvanian-age Wells Limestone. Interbeds of the Park City Formation can occur below and within the Phosphoria as the Grandeur tongue of the Park City Formation and as the Fransen member that is intermittently found below the Rex Chert Member of the Phosphoria Formation. The outcrop of the Phosphoria Formation is often identified in the field by the "phosphate swale" created from the erosion of the softer Phosphoria Formation from between the more resistant Rex Chert Member of the Phosphoria Formation and the Grandeur Tongue of the Park City Formation (stratigraphic column in Table 3-21).

Geology of the Meade Peak Phosphatic Shale Member of the Phosphoria Formation

Stratigraphy

"In Idaho, the Phosphoria Formation of Permian age disconformably overlies the Park City Formation of Permian age and the Wells Formation of Pennsylvanian and Permian age and is unconformably overlain by the Dinwoody Formation of Triassic age (McKelvey and others, 1959; Peterson, 1980). The Phosphoria grades northward into the Shedhorn Sandstone in south-central Montana and northwestern Wyoming and southward and eastward into the Park City Formation in northeastern Utah and west-central Wyoming (McKelvey and others, 1959)" (USDI-USGS MR-72, 1984) (Figure 3-25).

The Phosphoria Formation is generally subdivided into two members, the Meade Peak and Rex Chert (Table 3-21). The Meade Peak Member, which contains the phosphate rock as defined by Hale (1967), consists of interbedded phosphorite, mudstone, and limestone. The waste units consist of interbedded shale, mudstone, siltstone, and thin phosphorite beds. The base of the Meade Peak is characterized by a thin phosphorite bed containing occasional fish scales, bones, and small nodules (McKelvey and others, 1959, p.23) known as the fish scale marker bed (Hale, 1967). "The top of the Meade Peak is not as well defined. In southeastern Idaho, the uppermost bed is either a thin, nodular phosphorite, commonly containing gastropods resembling

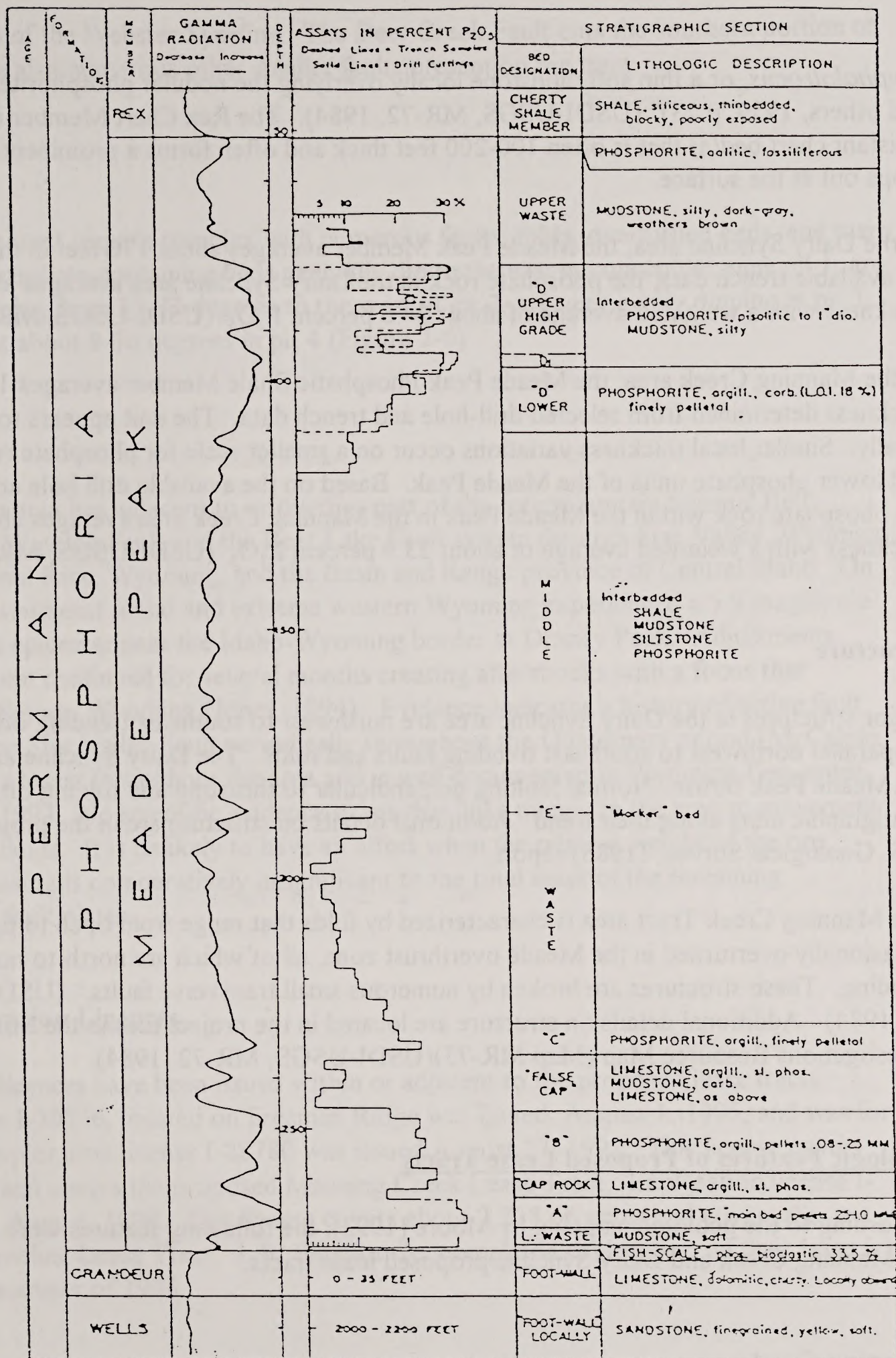


Table 3-21 - Typical Section of Lower Phosphoria, Dry Valley Area, Caribou County, Idaho (Hale, L.A., 1967. Anatomy of the Western Phosphate Field, Intermountain Association of Geologists)

Omphalotrochus, or a thin soft mudstone locally overlying the nodular phosphorite (McKelvey and others, 1959, p.23)" (USDI-USGS, MR-72, 1984). The Rex Chert Member is a hard, resistant chert bed(s) that is often 100-200 feet thick and often forms a prominent ridge where it crops out at the surface.

In the Dairy Syncline area, the Meade Peak Member averages about 170 feet in thickness. Based on available trench data, the phosphate rock in the Dairy Syncline area averages about 55 feet in thickness with a weighted average of about 24.6 percent P_2O_5 (USDI-USGS, MR-74, 1985).

In the Manning Creek area, the Meade Peak Phosphatic Shale Member averages 170 - 180 feet in thickness determined from selected drill-hole and trench data. The unit appears to pinch and swell locally. Similar local thickness variations occur on a smaller scale for phosphate rock in the upper and lower phosphate units of the Meade Peak. Based on the available drill hole and trench data, the phosphate rock within the Meade Peak in the Manning Creek area averages about 58 feet in thickness with a weighted average of about 23.9 percent P_2O_5 (USDI-USGS, MR-75, 1985).

Structure

Major structures in the Dairy Syncline area are northwest to southeast trending ridges created by subparallel northwest to southeast trending faults and folds. The Dairy Syncline area lies along the Meade Peak thrust. Normal faulting perpendicular to thrusting and folding often displaces stratigraphic units along their trend. Additional details on structure are in the project files in a U.S. Geological Survey, (1985) report.

The Manning Creek Tract area is characterized by folds that range from open to tight and are occasionally overturned in the Meade overthrust zone, all of which are north-to northeast-trending. These structures are broken by numerous small transverse faults." (USDI-USGS, MR-72, 1984). Additional details on structure are located in the project files in the Minerals Investigations Resource Map (Map MR-75)(USDI-USGS, MR-72, 1984).

Geologic Features of Proposed Lease Tracts

According to the geologic mapping by Moore (1992), the following features were noted within the Manning Creek and Dairy Syncline proposed lease tracts.

Manning Creek

The Meade Peak Member occurs on either side of a range, on east-southeast and north-northwest slopes. The beds are generally dipping to the northwest and west at angles of 5 to 40 degrees and

are on the east limb of the Webster Syncline. The Deer Creek Fault cuts the southern portion of the tract. There are also numerous other smaller faults present on the tract.

Dairy Syncline

The geology of this tract is quite complex with numerous faults, folds, overturned beds, and many unknowns. The phosphate-containing beds generally dip to the east in conceptual mine pit 1, are overturned and dipping from 35-73 degrees to the west of pit 2, are very gently dipping in pit 3, and dip northeast at about 8-36 degrees in pit 4 (Figure 2-6).

Seismic Activity

The general project area lies adjacent to or overlies part of the Intermountain Seismic Belt which includes the Wasatch Fault and the Bear Lake Fault system through Star Valley, Wyoming, Yellowstone National Park, Wyoming, and the Basin and Range province of Central Idaho. On February 3, 1994, southeast Idaho and extreme western Wyoming experienced a 5.9 magnitude earthquake with its epicenter near the Idaho-Wyoming border at Draney Peak. Adjustments along the fault system continued for several months creating aftershocks with a focus that migrated south of Smoot, Wyoming (Jones, 1994). Evidence indicates a history of active fault movement along the Star Valley Fault periodically throughout the Quaternary period (McCalpin, 1990). Faulting is present throughout the area and is well documented in Wyoming Geo-notes, No. 41, February, 1994. No scientific evidence exists that links mining in the area to movement along deep seated faults. It is unlikely to have an effect when the relative weight of the ore removed for processing is comparatively insignificant to the total mass of the remaining overburden on the fault plates.

Phosphate Exploration Licences

Some exploration licences have been issued within or adjacent to the proposed lease tracts. Exploration license I-30536, located on Freeman Ridge was issued, August 1, 1995, and was for 1,836.42 acres. Exploration license I-28780 was issued August 27, 1992. This license covers about 1,880 acres and covers the proposed Manning Creek Lease Tract. Exploration license I-28807 was issued, August, 1992. This license covers about 2,738.66 acres and covers the proposed Dairy Syncline Lease Tract. J. R. Simplot Co. completed exploration on their lease I-01441 during the summer of 1996.

Table 3-22 Existing Leases Near The Proposed Lease Tracts by Ownership
(Information taken from Map of Southeastern Idaho Phosphate Field, revised 1995)

| Lease Holder | Lease Number | Acres |
|--------------------|--------------|----------|
| J.R. Simplot | I-30369 | 120.00 |
| J.R. Simplot | I-01441 | 438.29 |
| J.R. Simplot | I-012890 | 2,480.00 |
| J.R. Simplot | I-27801 | 120.00 |
| J.R. Simplot | I-26843 | 160.00 |
| Monsanto | I-0258 | 80.00 |
| Monsanto | Blkft-056009 | 200.00 |
| Monsanto | Blkft-055894 | 200.00 |
| Monsanto | I-01440 | 1,080.00 |
| Champ/ Williams | I-013731 | 360.00 |
| FMC | I-08194 | 1,640.00 |
| Alumet | I-014978 | 360.00 |
| Alumet | I-015259 | 280.00 |
| Rhone- Poulenc | I-07238 | 518.20 |
| Nu-West | I-07942 | 1,249.00 |
| Nu-West | I-05549 | 864.35 |
| Nu-West | I-07239 | 640.00 |
| Nu-West | I-07240 | 469.85 |
| Nu-West * | I-012989 | 1,120.00 |
| Nu-West | I-013649 | 120.00 |
| Nu-West * | I-04979 | 401.25 |

* indicates lease has been mined out.

Existing Phosphate Leases

Several existing leases are located within or adjacent to the study areas that encompass the proposed lease tracts. Some of the existing leases are shown on Figure 3-24 and are listed in Table 3-22.

Fluid Leasable Minerals

No production has resulted from exploration in southeastern Idaho; however, the Idaho-Wyoming-Utah portion of the Overthrust Belt is still considered to be a promising oil and gas province in the U.S. Oil and gas potential is rated moderate to low.

Saleable Minerals

Mississippian limestone associated with some of the phosphate mines has been found to be excellent road surfacing material. Not every mine has had good exposures of these rocks nor are they always necessary. Many of the mines use the Rex Chert Member of the Phosphoria Formation as road material because it is a hard and durable material and must be mined to access the ore in many cases.

Little commercial value exists for the chert because of its sharp nature and the speed in which it can break down. Non-commercial tires can be deeply cut and wear much faster when they have been run on chert.

Limestone has been used throughout the area as road material and is desirable because of its hardness and the lack of other suitable materials. Quarrying is sometimes done in abandoned mine pits to avoid potential safety conflicts with phosphate mining operations.

Locateable Minerals

No active mine claims are located within the proposed lease tracts. Twenty current mining claims exist along the west edge of the Dairy Syncline Tract for limestone. For locateable minerals other than limestone, the potential rating for the area is low (USDI-BLM, 1987).

Paleontological Resources

Paleontological (fossil) resources are known to occur in most of the rock units exposed in the proposed lease area. However, the paleontological resources will only be described for those geologic units that are likely to be disturbed.

Unconsolidated quaternary sediments are often present in the larger valleys and intermontane basins. Sediments of this age in other areas in southeast Idaho have yielded large Ice Age mammals (mammoth, mastodons, horses, camels, ground sloths, bison, etc.), carnivores, rodents, and other animals. These sediments are from lake, stream, and/or wind-blown deposits and consist of clays, silts, sands, and gravel.

The Triassic Thaynes Formation would be impacted by transportation or facility developments away from the potential mining areas. The Thaynes generally consists of black shale, limestone, siltstone, and sandstone. Most of the fossils in this unit are marine invertebrates (Mansfield, 1927) like molluscs (clams, snails, and cephalopods) and brachiopods (clam-like animals). These fossils are often quite abundant as in the case of the Meekoceras beds at the base of the Formation. This horizon, which is geographically widespread, contains very abundant ammonoids (cephalopods) mostly of the genus Meekoceras.

Some ichthyosaur (extinct marine reptile) bones were found in beds of the Thaynes Formation several miles to the southwest of the proposed lease area (Massare and Callaway, 1994). A shark tooth was also found in the Meekoceras beds at the base of the Thaynes a few miles northeast of the Dairy Syncline Tract (Robison, personal communication, 1996). These vertebrate fossils are considered significant academically. However, they are rare occurrences. The Triassic Dinwoody Formation, consisting mostly of limestone, shale and sandstone, is less fossiliferous than the Thaynes, although there are some beds that contain abundant fossil clams (Mansfield, 1927). These fossils are common and well known.

The Permian Phosphoria Formation is generally divided into the Rex Chert and Mead Peak Members. The Rex Chert lies stratigraphically above the Mead Peak and, as the name suggests, is predominantly chert with cherty shale and limestone beds. This cherty unit does contain some marine fossils, generally brachiopods (clam-like animals), and occasionally crinoid (sea lily) fragments and sponge spicules (Mansfield, 1927).

The Mead Peak Member contains the phosphate rock and other shale, mudstone, and limestone beds. Fossils found in this unit include locally abundant molluscs (clams, snails, and occasionally cephalopods) and brachiopods. Of special interest in the Mead Peak Member are the vertebrate fossils, sharks, and fish (Akersten, personal communication, 1996). The shark Helicoprion, with its spirally-arranged teeth, is well known. Other lesser known sharks and bony fish are much more uncommon yet important fossils. Rarely, articulated fish remains have been found (Bowles, personal communication, 1995).

The Wells Formation which underlies the Phosphoria consists of limestone, sandy limestone, and sandstone. G. H. Girty, as quoted in Mansfield (1927), describes the fossil fauna from the Wells as follows: "The fauna of the Wells Formation lacks both variety and interest." In some units of the Wells, brachiopods are very abundant as are bryozoans (coral-like animals). Other marine organisms are present, although not common, in the Wells including corals, molluscs, sponges, and forams. Most of these forms are abundant in other rocks of the same age in the western US.

The Grandeur Member of the Park City Formation is sometimes present immediately below the Phosphoria Formation. This limestone unit is sometimes highly fossiliferous containing marine invertebrates like brachiopods, molluscs, bryozoans, and sometimes corals.

EXISTING TRANSPORTATION RESOURCES (Roads)

Introduction

Following is a description of the existing road system within and/or next to the two proposed lease tracts that could be affected by leasing and the potential development scenarios (Figures 3-26 and 3-27). The trail system is discussed in the Recreation section of this chapter.

Manning Creek Tract

Current access to the proposed Manning Creek Lease Tract is provided by the Crow Creek Road (#20111). This road is a north to south arterial route beginning at Highway 89 in Montpelier Canyon and ending to the north in Afton, Wyoming. In the vicinity of the proposed lease tract, it is a double lane graveled road. The sections thru private lands are under Caribou County jurisdiction. The county has expressed interest in acquiring jurisdiction of the two mile section of this road across the National Forest near Manning Creek. This route is a historic route and provides thru access for a variety of forest and non-forest users.

Direct access to the proposed lease tract is provided by the Manning Creek Road (#20740). This is a single lane, native surface road that was improved for timber access in the past. It is managed as an open road and provides access for permittees and dispersed recreation users. It is planned to be used as the haul route for the potential Upper Manning Creek Timber Sale in 1997.

A low standard exploration road was constructed off of the Manning Creek Road in the summer of 1993 to provide access for preliminary exploration of the proposed lease tract. With some relocation of the lower sections of this exploration road, it would be used to access stands in the Upper Manning Creek Timber Sale located within the proposed lease tract. This exploration road is managed as closed to motorized vehicles.

Dairy Syncline Tract

Access to the proposed Dairy Syncline Lease Tract is provided by the Slug Creek Road (#20095). This two-lane, graveled road provides north to south thru access across the Forest. Caribou and Bear Lake Counties have recently acquired USDA easements for their respective sections of this road across the Forest giving them jurisdiction. This road is an important arterial route for a variety of forest and non-forest users including ranchers, loggers, miners, and recreationists. On the Caribou County side, the road is used as a part of the Trail Canyon groomed snowmachine trail from the Trail Canyon Road to the Harrington Peak Road.

Direct access to the proposed lease tract is provided by the Green Basin road system that was reconstructed and expanded for the Huckleberry Timber Sale in 1994. This road system takes off the Slug Creek Road and includes the following roads:

- Wilde Canyon Road (#20187)
- Green Basin Road (#20200)
- South Green Basin Road (#20667)
- Upper Green Basin Road (#20668)
- Middle Green Basin Road (#21308)
- Lower Wilde Canyon Road (#21309)
- BS2 (#20589)

These roads are all single lane, native surface roads. Except for Middle Green Canyon Road (#21308) most of these roads remained open after the sale for public access. Their main use is to provide access for permittees, mineral exploration, and for dispersed recreation such as fuelwood gathering and hunting.

The Wilde Flat Road (#21236) is located just south of the proposed lease tract. It was also constructed as a timber sale access road. It is managed as a closed road between timber sale entries.

Farther to the south, the Harrington Peak Road (#21238) takes off from the Slug Creek Road at the county line. This road is a higher standard, collector road constructed for the Big Basin Timber Sale. It provides the main access to the forest lands west of the proposed lease tract. It is a single lane road that is surfaced for the first three miles. This road provides access for permittees, loggers, minerals exploration, and dispersed recreation users. It has a seasonal closure (with gates) on the first three miles and is part of the Trail Canyon groomed snowmachine route.

On the east side of the Slug Creek Road, there are at least two roads that could be affected by the potential development scenarios. They are the Dry Canyon Road (#20123) and the Slug Creek-Dry Valley Road (#20387). Both roads are open to the public and provide access from Slug Creek Road to the Dry Valley Road. The Slug Creek-Dry Valley Road was reconstructed to provide secondary access to the Mountain Fuel Mine in Dry Valley, particularly for mine employees commuting from the Georgetown area. This mine is currently closed. The Dry Canyon Road provides similar access and there is a waterline for range livestock buried within the road.

NATIVE AMERICAN TREATY RIGHTS AND RESOURCES

Introduction

This section describes the existing condition as it relates to Issue 7.

Issue 7 - The effects of proposed phosphate leasing and subsequent exploration, mining, and development activities on the Treaty Rights of the Shoshone-Bannock Tribes.

Certain rights and privileges are claimed by members of the Shoshone-Bannock Tribe in relation to the Caribou National Forest. The entire study area falls within the lands historically used by the Shoshone-Bannock Tribe. The Tribe has some off-reservation rights on the unoccupied lands on the United States by virtue of the Treaty of 1855. Specific rights include fishing, hunting, plant gathering, and grazing livestock.

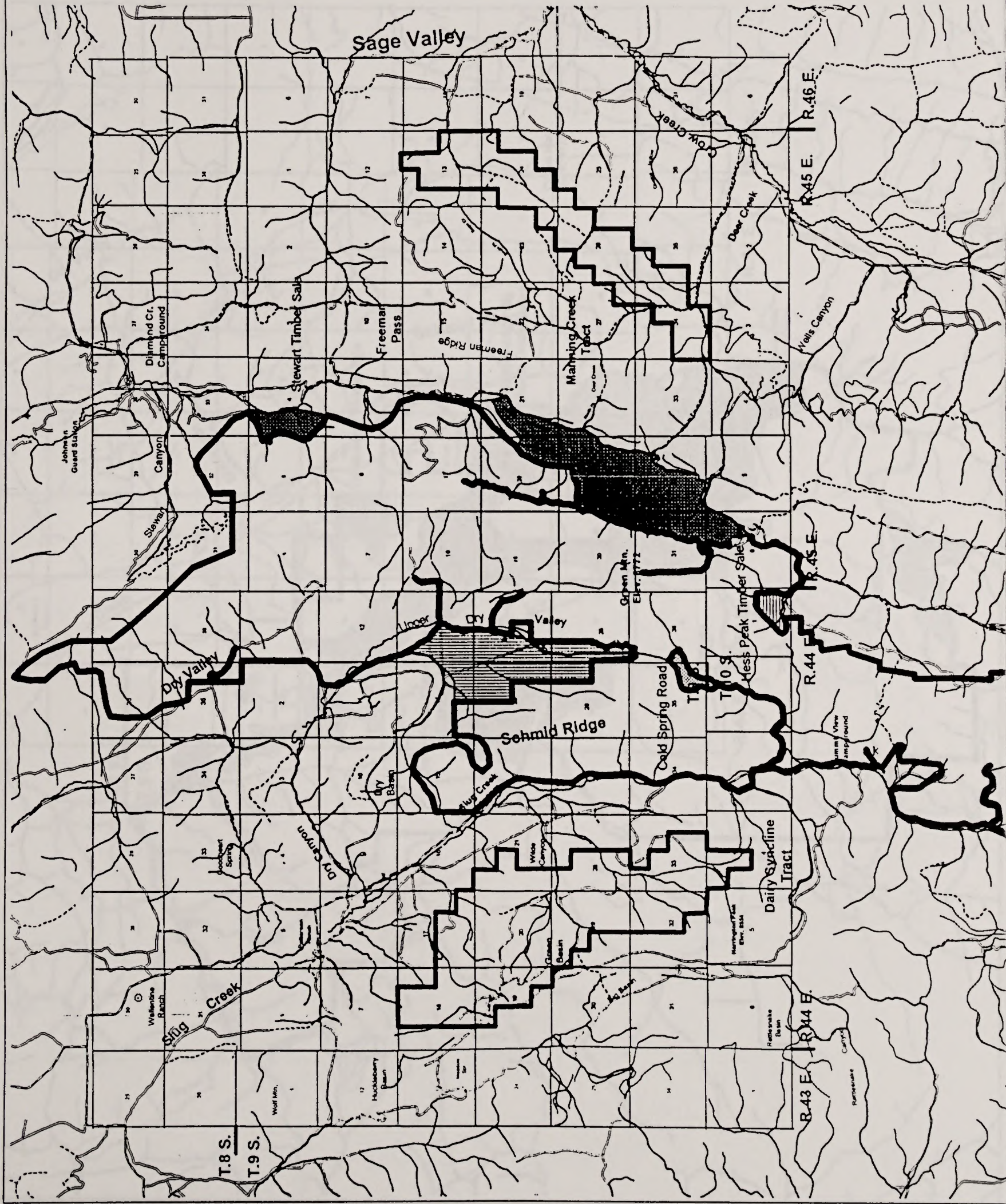
In addition to these specific rights, Native Americans have the right to believe, express, and exercise their traditional religious practices. This includes having access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites. A possible right is that the habitat upon which the plants and animals rely would be protected from degradation, ensuring continuance of a supply of these plants and animals. Federal agencies such as the Forest Service have a trust responsibility to the tribes to maintain these resources in a viable and sustainable manner. Site disturbance caused by management activities is a major concern as plants would be affected, animal patterns may change, a fishery could be affected, and unknown religious sites impacted. Oftentimes, a site is known only to certain families and not the tribe as a whole. The tribe was contacted during scoping, and Forest Service personnel met with a tribal representative to discuss the proposed leases.

Traditional and Sacred Resources

The Shoshone-Bannock Tribes have a long history in southeastern Idaho and they regard much of the area as sacred and important for traditional purposes. As previously noted, "Tribal staff

recognized tribal activities on lands within the project analysis area that may be impaired by the potential project activities” (Issue 7, page 2-6). To date, however, they have not identified any specific areas within either of the proposed tracts as sacred or important for traditional uses. The Blackfoot River water is an important tribal resource.

Figure 3 - 1
Dry Ridge Roadless Area
Existing Condition



LEGEND

- Dry Ridge Roadless Area (04164)
- Mine
- Stewart Timber Sale
- Hess Peak Timber Sale
- Cold Spring Road
- Developed Road (area proposed to be dropped)
- Manning Creek and Dairy Syncline Tracts
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Drains

A

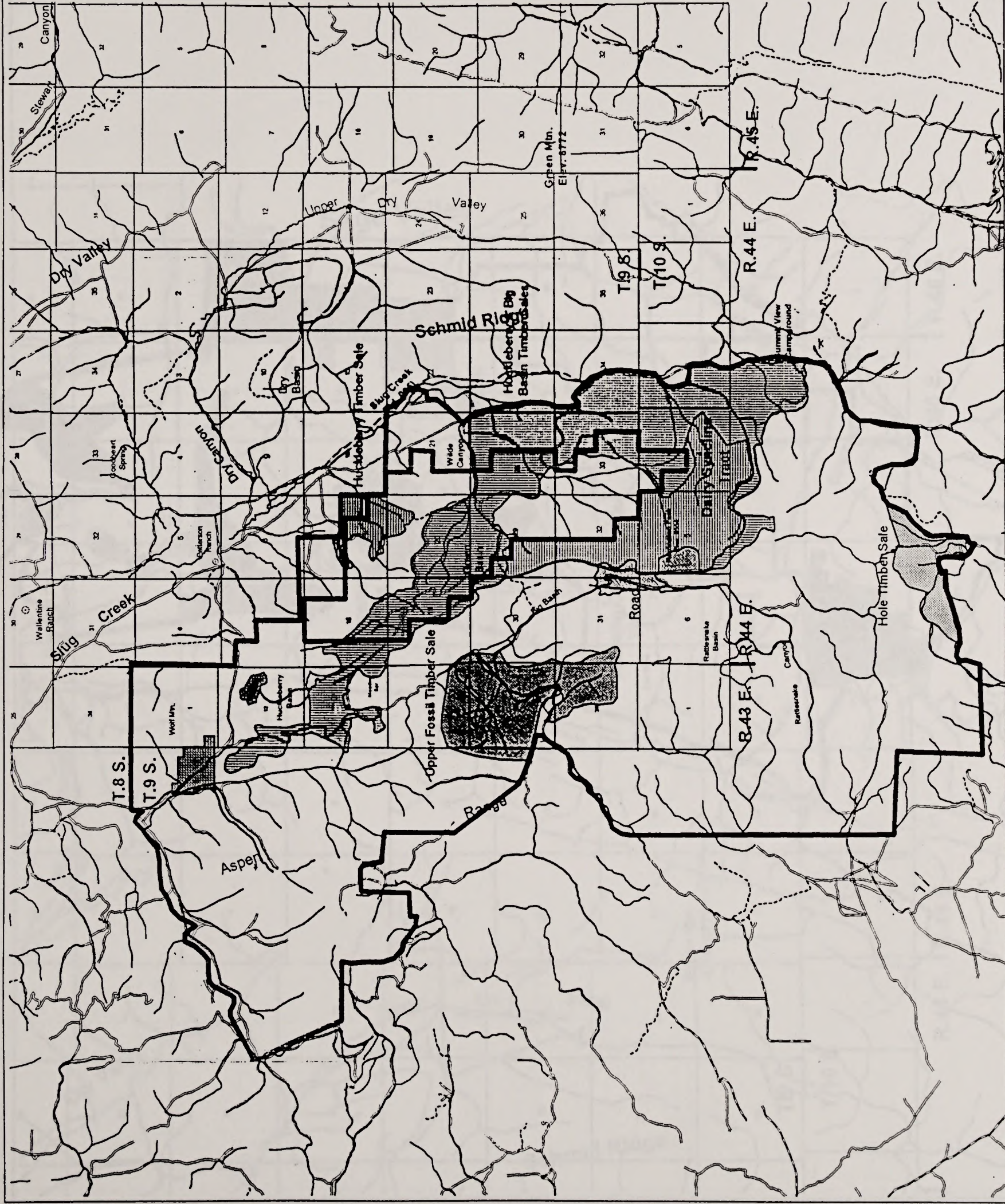
Map Source: Caribou
National Forest
GIS Library, 2/97

Caribou National Forest
Phosphate Lease
Environmental Impact Statement
U.S. Forest Service and
Bureau of Land Management

Scale



Figure 3-2
Huckleberry Basin
Roadless Area
Existing Condition



LEGEND

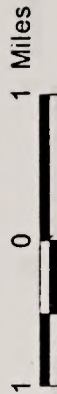
- Huckleberry Basin Roadless Area (04165)
- Private Land (Not Included in Roadless)
- Peterson Ranch Access Road
- Road
- Big Basin Timber Sale
- Huckleberry & Big Basin Timber Sales
- Huckleberry Timber Sale
- Alumet Constructed Road
- Upper Fossil Timber Sale
- Proposed Removal From Roadless Area
- Hole Timber Sale
- Dairy Syncline Tract
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Drainages

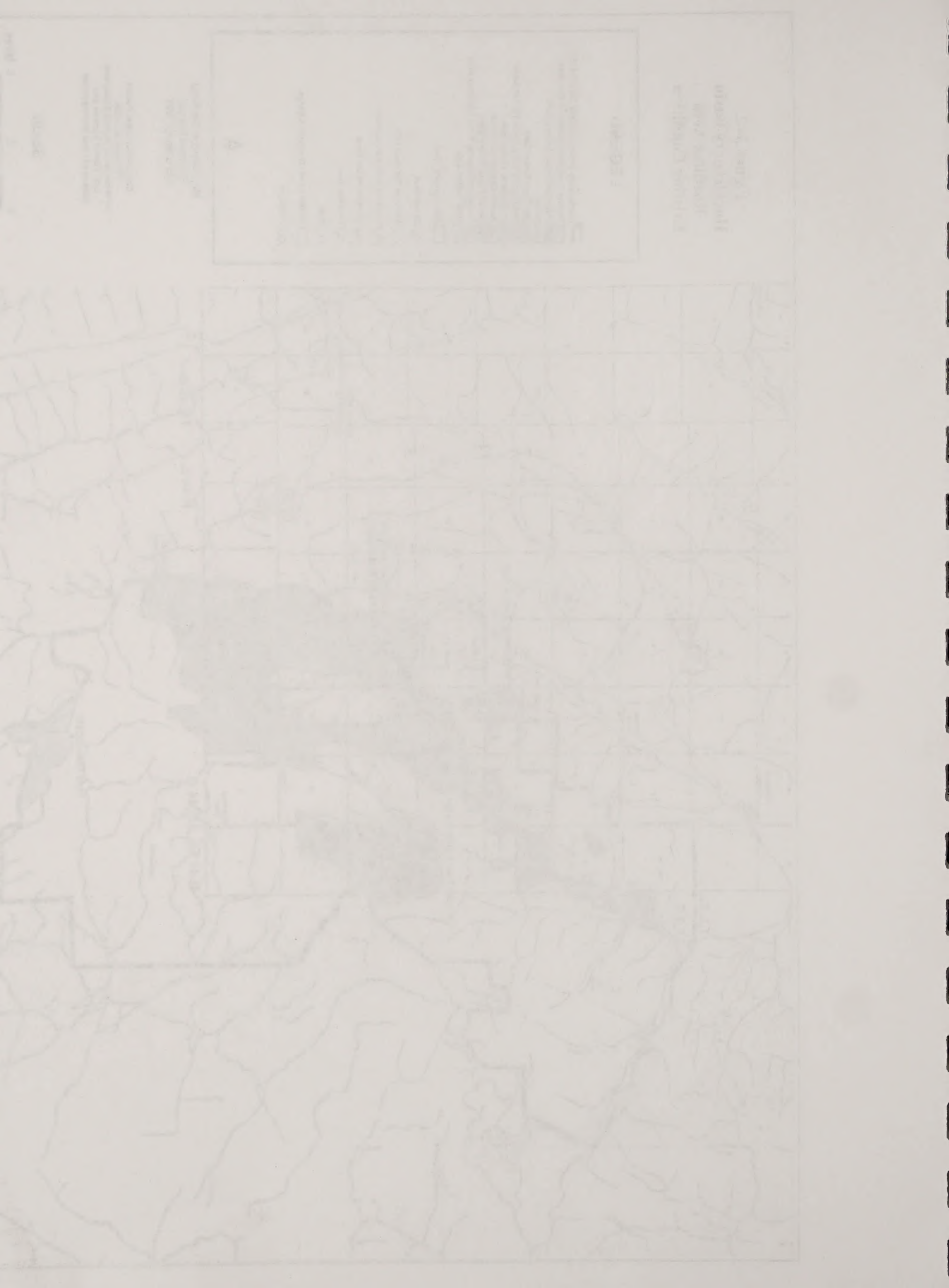
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Map Source: Caribou
 National Forest
 GIS Library, 2/97

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 U.S. Forest Service and
 Bureau of Land Management

Scale



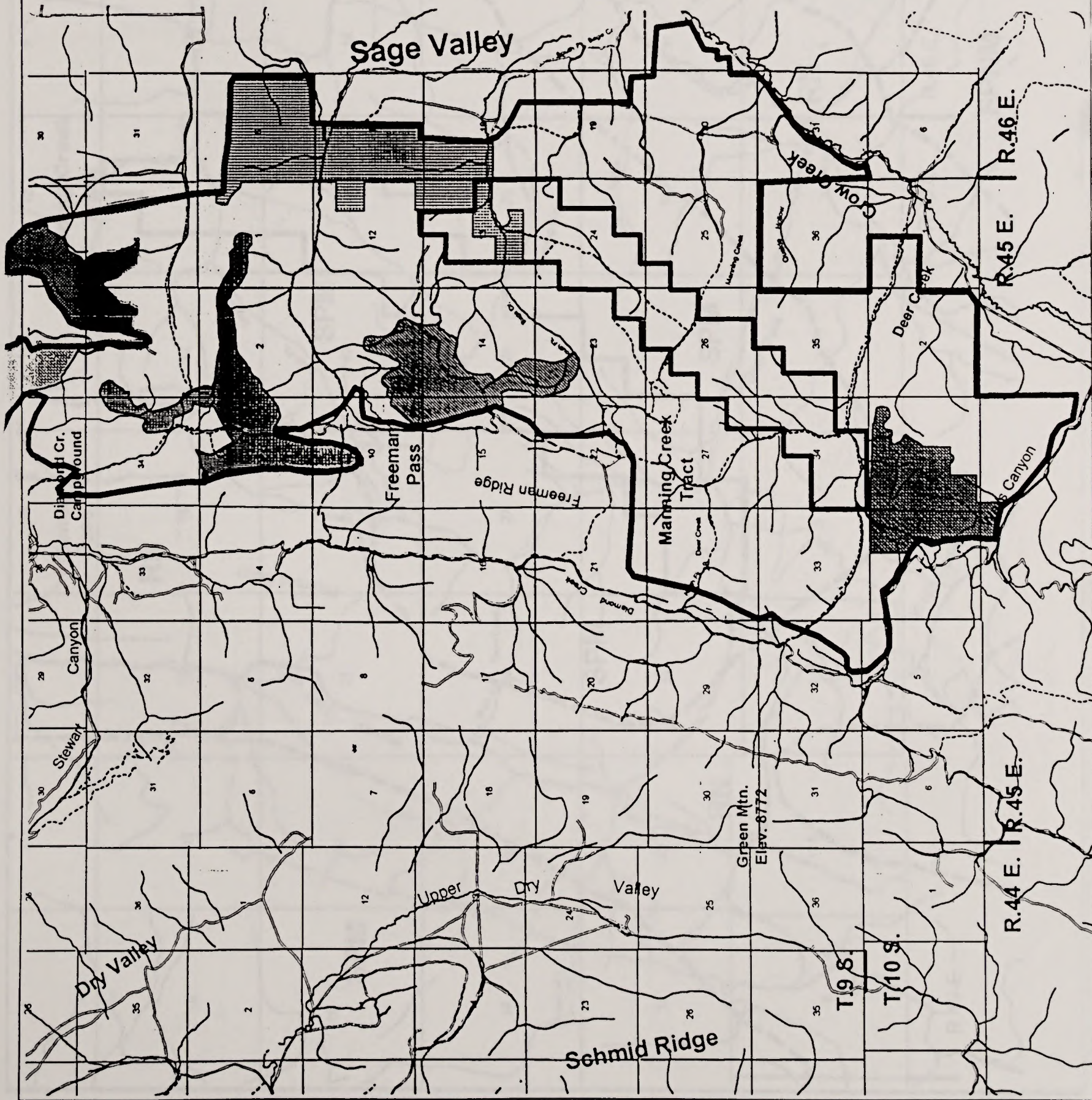


Topographic Map of the Region
Scale 1:50,000
North Arrow

Legend

1

Figure 3 -3
Sage Creek Roadless Area
Existing Condition



LEGEND

- Sage Creek Roadless Area 04166
- South Fork Timber Sale (1)
- Sage Fork Timber Sale (2)
- Phosphate Exploration
- South Fork Timber Sale & Roads
- Pole Canyon Timber Sale
- Mine Development & Exploration
- Dairy Syncline Tract
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Drainages

4

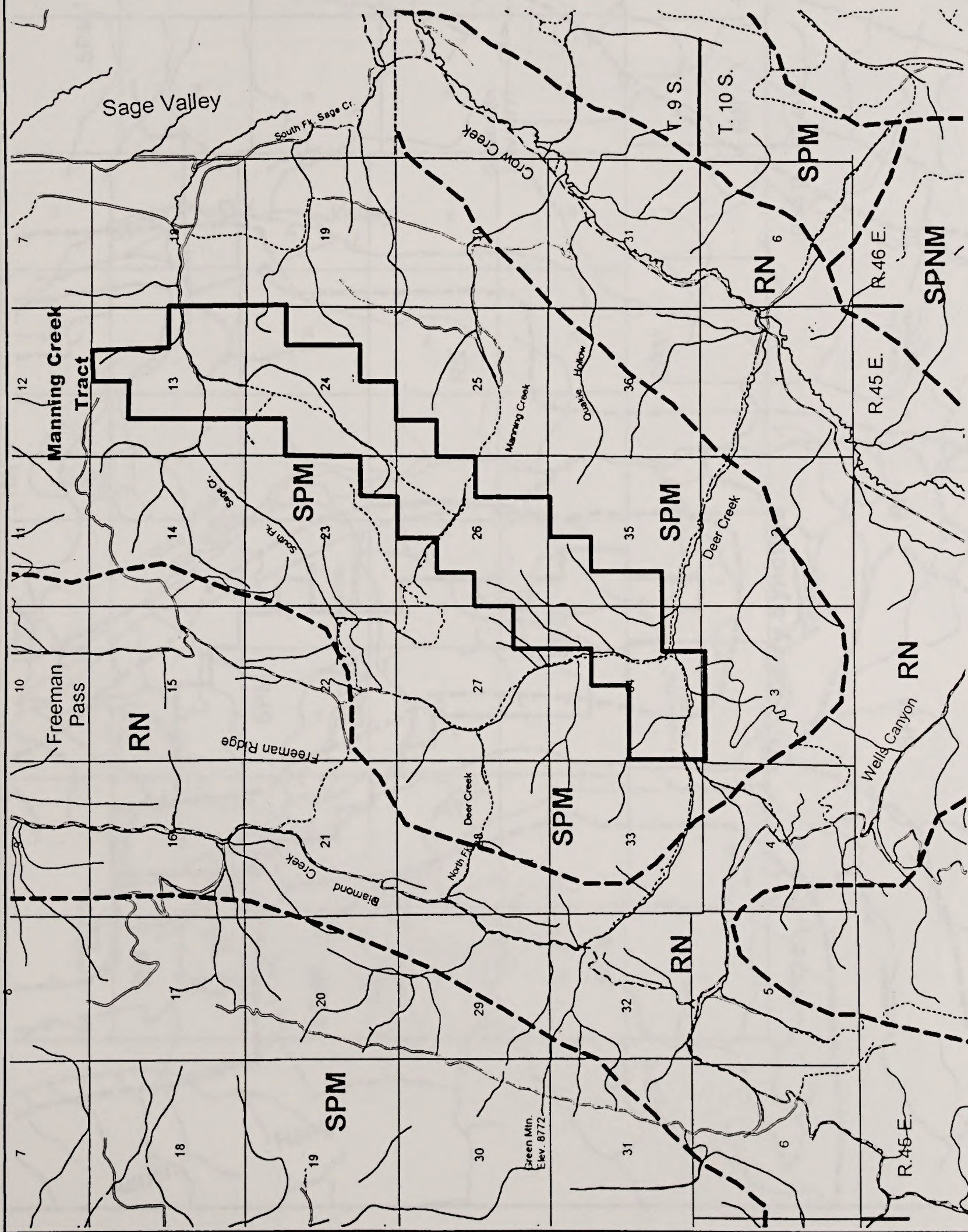
Map Source: Caribou
 National Forest
 GIS Library, 2/97

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Scale

1 0 1 Miles

Figure 3 - 4
Manning Creek Tract
Recreation Opportunity
Spectrum (ROS)



LEGEND

| | |
|--|----------------------------------|
| | Proposed Lease Tract |
| | RN ROS Classifications |
| | SPM ROS Classifications |
| | SPNM ROS Classifications |
| | Gravel Road |
| | Improved Dirt Road (3C) |
| | Improved Road (Dirt Surface) |
| | Unimproved Dirt Road |
| | Uncoded Road |
| | Trail |
| | Section Lines (Township & Range) |
| | Drainages |

A

Map Source: Caribou
National Forest
GIS Library, 2/97

Caribou National Forest
Phosphate Lease
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Bureau of Land Management

Scale

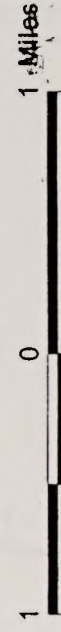
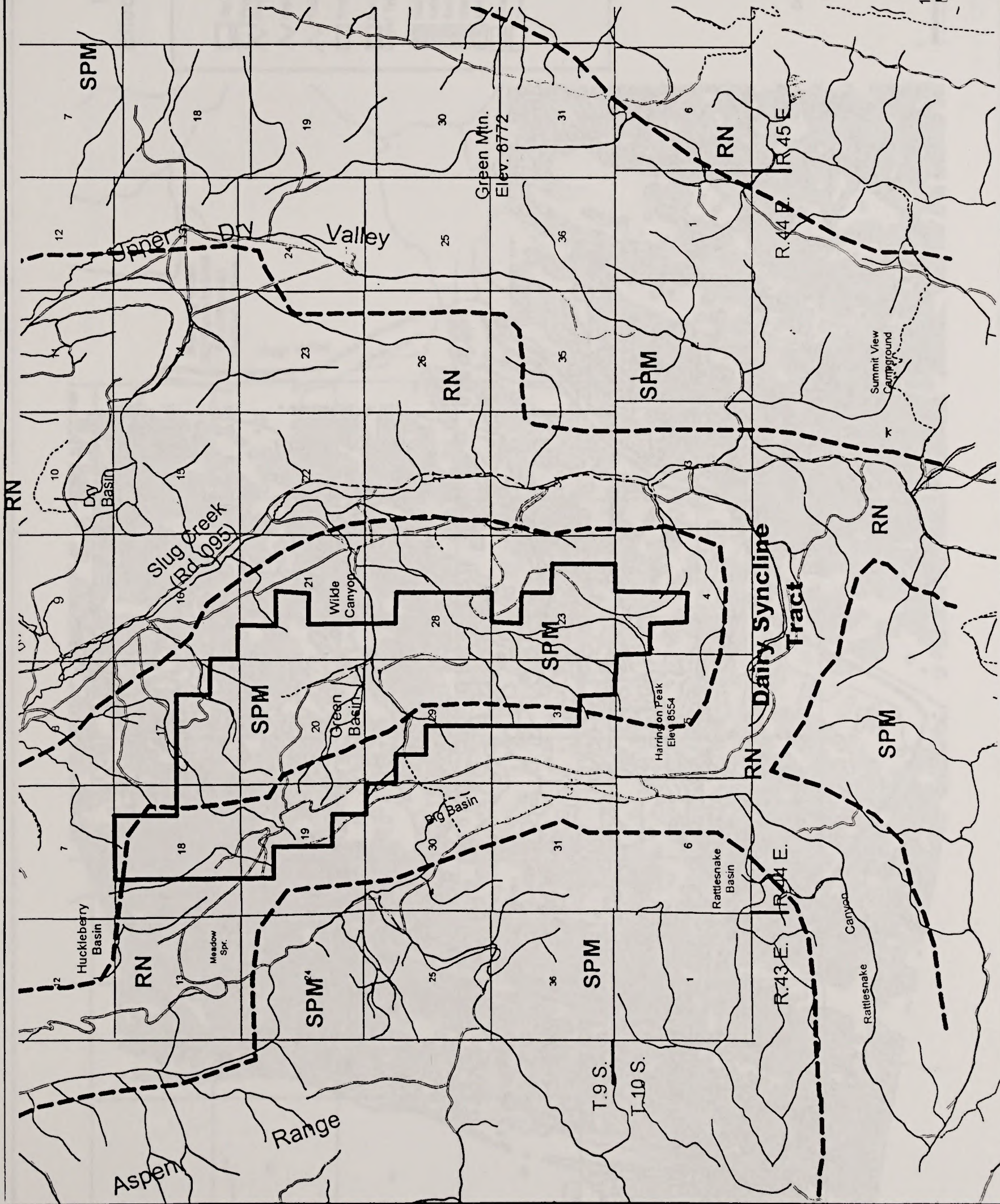


Figure 3 - 5
Dairy Syncline Tract
Recreation Opportunity
Spectrum (ROS)



LEGEND

- Proposed Lease Tract
- RN ROS Classifications
 - RN Rooded Natural
 - SPM Semi Primitive Motorized
 - SPM Semi Primitive NonMotorized
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Drainages

4

Map Source: Caribou
 National Forest
 GIS Library, 2/97

Caribou National Forest
 Phosphate Lease
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Scale

0

1

Miles

Figure 3 - 6
Manning Creek
Big Game Habitat
Effectiveness Assessment



Legend

- Big Game Habitat Assessment Area
- Proposed Lease Tract
- Gravel Road
- Improved Road (Dirt Surface)
- Trail
- Section Lines (Township & Range)
- Harvest Units (classified as forage)
- Cover Types (approx delineations based on Veg GIS)
- Marginal Thermal Cover (LP)
- Satisfactory Thermal Cover (DF)
- Satisfactory Thermal Cover (Mixed Conifer)
- Marginal Thermal Cover (Aspen)
- Marginal Thermal Cover (Aspen/Conifer)
- Forage Habitat (<40% Canopy)
- Cover & Forage Deficient Areas

A

Map Source: Caribou
National Forest
GIS Library, 2/97

Caribou National Forest
Phosphate Lease
Environmental Impact Statement
U.S. Forest Service and
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Scale

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Legend

Scale

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Figure 3 - 7
Dairy Syncline
Big Game Habitat
Effectiveness Assessment



Legend

- Big Game Habitat Assessment Area
- Proposed Lease Tract
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Harvest Units (classified as forage)
- Cover Types (approx. delineations based on veg GIS)
- Marginal Thermal Cover (LP)
- Satisfactory Thermal Cover (DF)
- Satisfactory Thermal Cover (Mixed Con)
- Marginal Thermal Cover (Aspen)
- Marginal Thermal Cover (Aspen/Conifer)
- Forage Habitat (<40% Canopy)
- Cover Deficient Areas

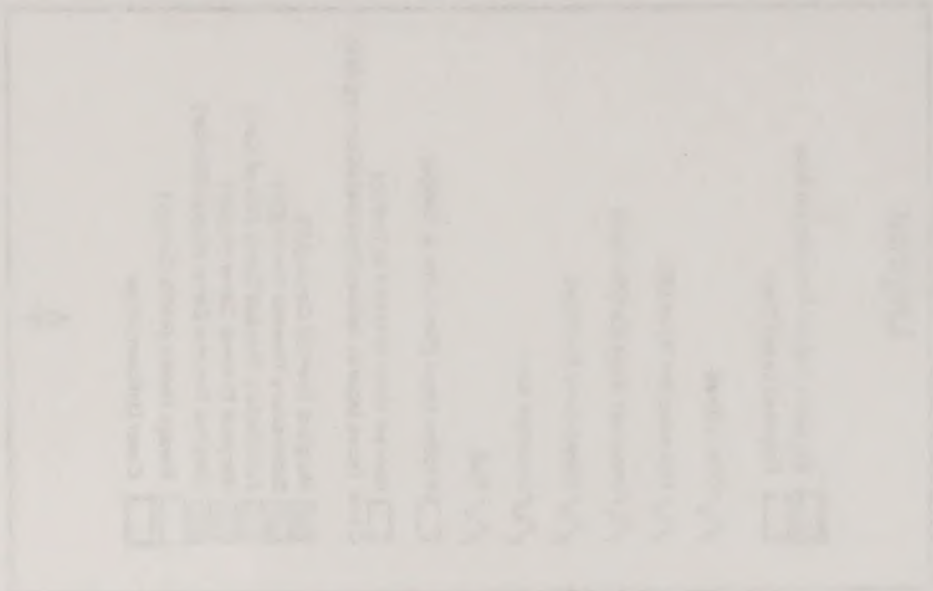
North Arrow

Map Source: Caribou
 National Forest
 GIS Library, 2/97

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Scale

1 0 1 Miles



Geological map of the Pacific Northwest
 showing the distribution of the various geological units.
 (after [illegible])

Figure 3 - 8
Manning Creek
Wildlife Habitats



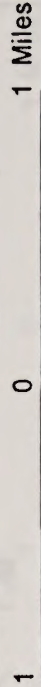
Legend

- Proposed Lease Tract
- Gravel Road
- Improved Road (Dirt Surface)
- Trail
- Drainages
- Section Lines (Township & Range)
- Elk Wintering Habitat
- High Value Elk Calving
- Blue Grouse Wintering Habitat
- Deer Winter Habitat
- Bald Eagle Wintering Habitat
- Cougar Habitat
- Uncoded Data

Map Source: Caribou
 National Forest
 GIS Library, 2/97

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Scale



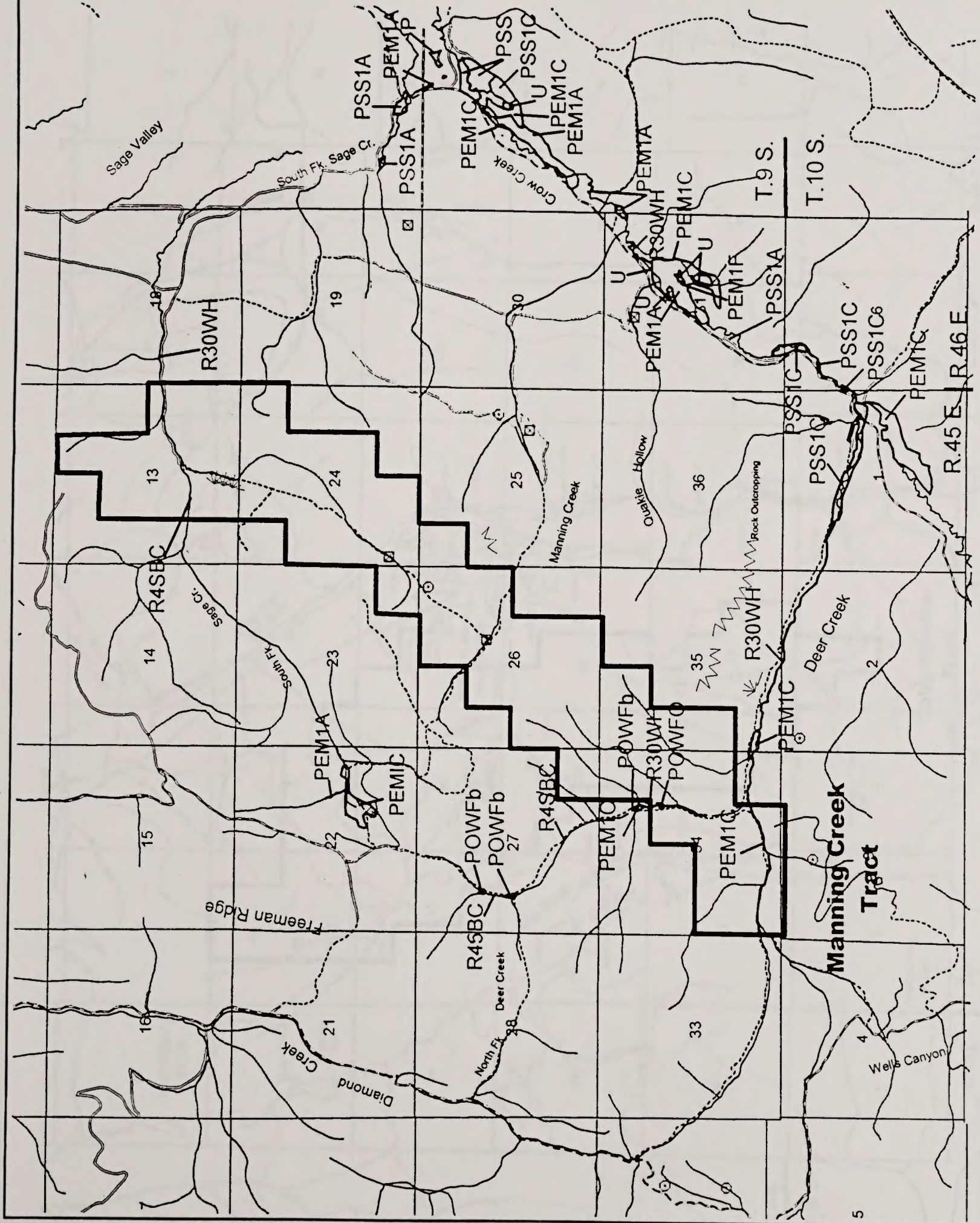
This topographic map depicts the Aspen Range area, characterized by numerous basins and canyons. Key features include:

- Basins:** Huckleberry Basin, Green Basin, Big Basin, Rattlesnake Basin, and Delcy-Syncline Tract.
- Canyons:** Upper Dry Valley, Slug Creek (Bd. 1951), and Wilde Canyon.
- Peaks:** Herrington Peak (Elev. 8554) and Green Mtn. (Elev. 8772).
- Geographic Labels:** Aspen Range, Peterson Ranch, and Summit View.
- Grid System:** Townships T.10 S. and T.13 S.; Ranges R.43 E., R.44 E., and R.45 E.
- Other Features:** Dry Canyon, Beech Migration Route, and various contour lines indicating elevation.

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0 1 Miles

Figure 3 - 10
Manning Creek Tract
Tract Unique & Special
Wildlife Habitat



LEGEND

- Proposed Lease Tract
- Perennial Stream
- Intermittent Stream
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Talus
- Rock Outcropping
- Water Development
- Spring
- Wetland
- Upland
- Reverie
- 3 = upper perennial
- 4 = intermittent
- H = permanently flooded
- SB = seasonally flooded
- C = cobble
- P = Pulverine
- EM = Emergent
- 1 = persistent
- A = temporary, B = saturated
- C = seasonal
- F = semi-permanent
- OW = Open Water
- b = beaver
- H = permanent
- SS = Shrub/scrub
- 1 = broad-leaf deciduous
- A = temporary, B = saturated
- C = seasonal
- F = semi-permanent

Map Source: Caribou
 National Forest
 GIS Library, 297

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Scale
 0 1 Miles

Figure 3-11
Dairy Syncline Tract
Unique & Special
Wildlife Habitat

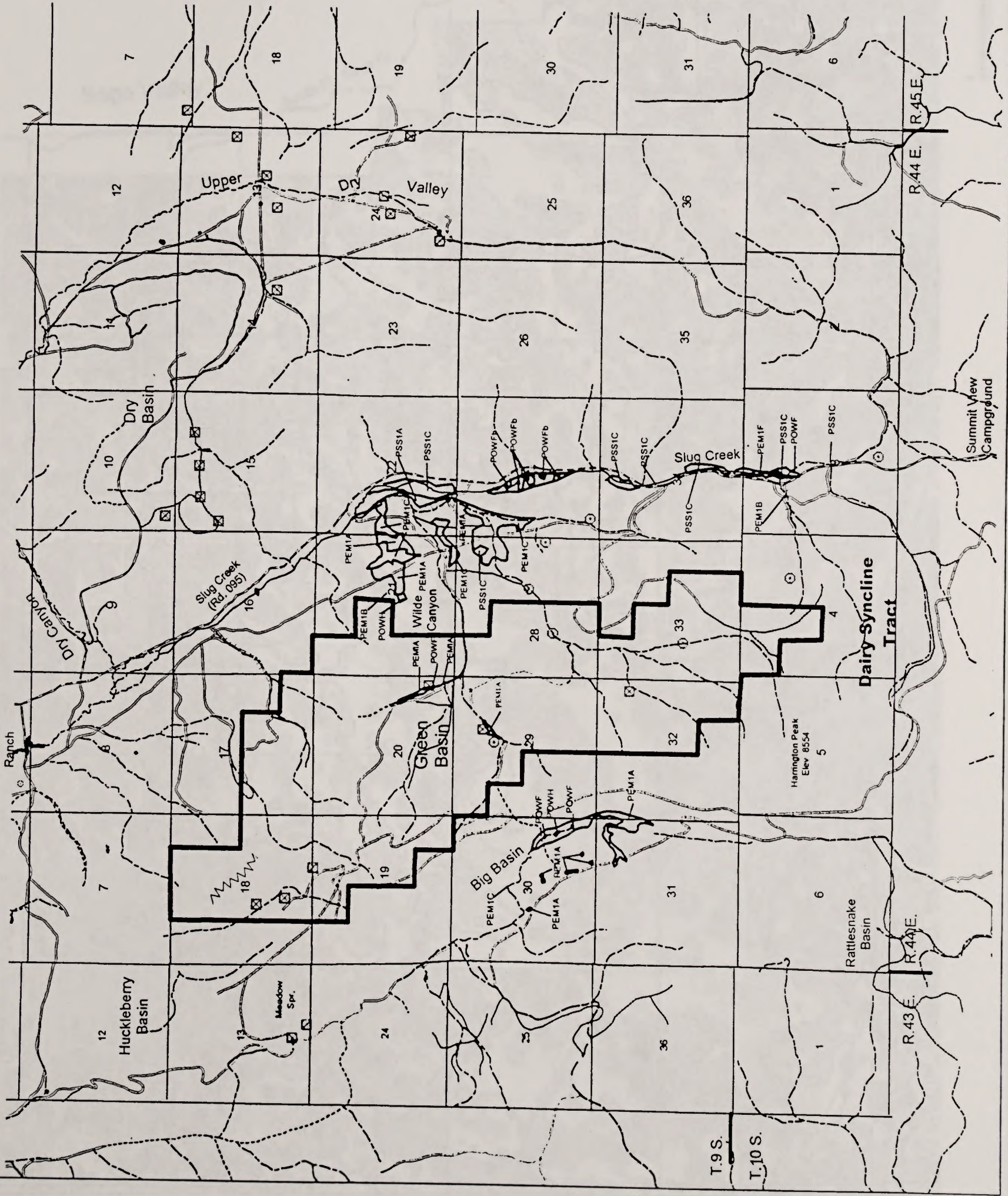
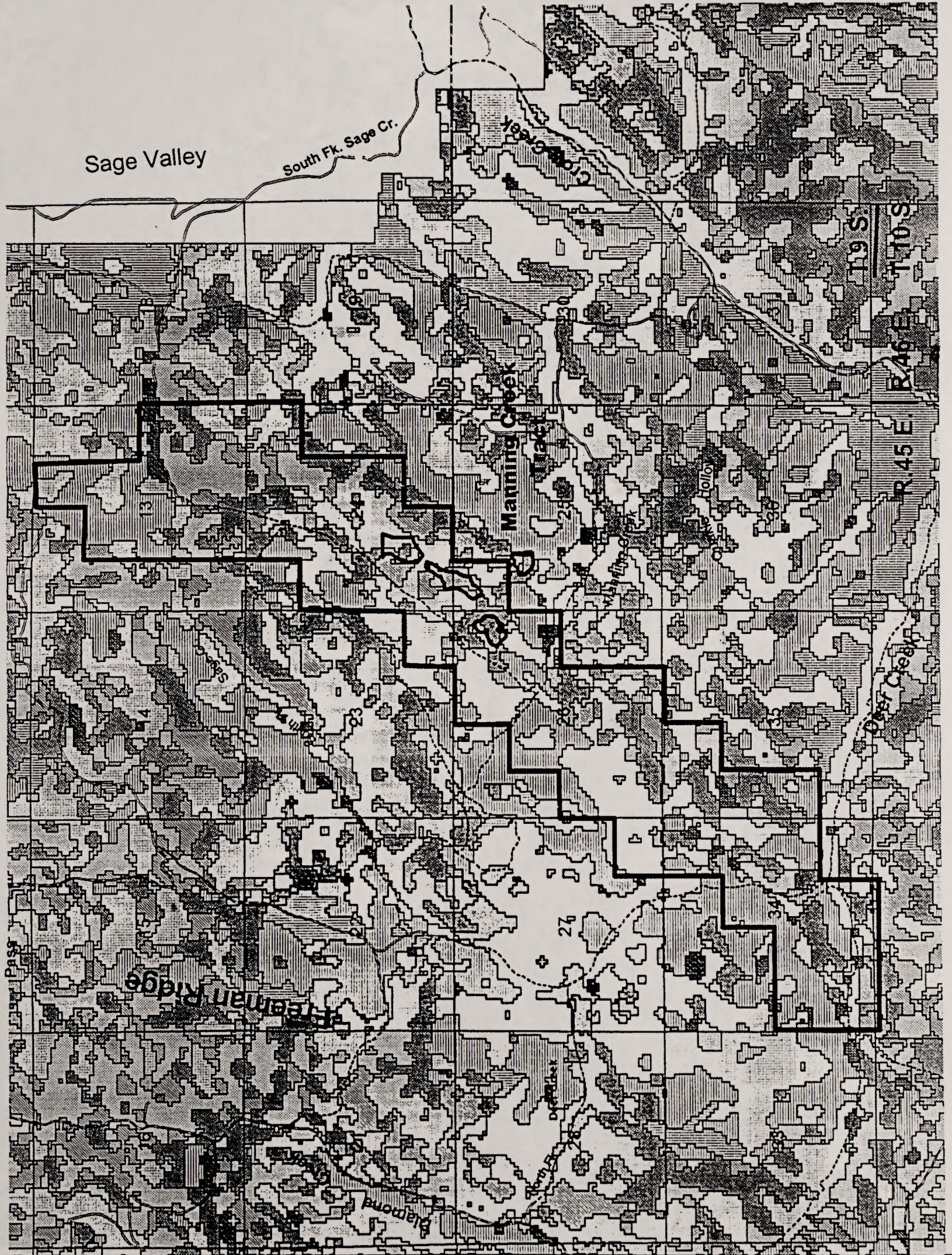


Figure 3 - 12
Manning Creek Tract
Vegetation Types
(Old Growth & Timber)



Legend

- Proposed Lease Tract
- Gravel Road
- Improved Road (Dirt Surface)
- Trail
- Section Lines (Township & Range)
- Vegetation Types**
 - Uncoded Data
 - Lodgepole Pine
 - Douglas-fir
 - Mixed Conifer
 - Aspen
 - Aspen/Conifer
 - Timber Encroachment
 - Sagebrush/Grassland
 - Mountain Brush
- Old Growth (approx size & location)

4

Map Source: Caribou
 National Forest
 GIS Library, 2/97

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Scale

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1 Miles

Legend
1. 100 ft. contour interval
2. 100 ft. contour interval
3. 100 ft. contour interval
4. 100 ft. contour interval

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100 ft. contour interval

7

1. 100 ft. contour interval
2. 100 ft. contour interval
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4. 100 ft. contour interval

1. 100 ft. contour interval
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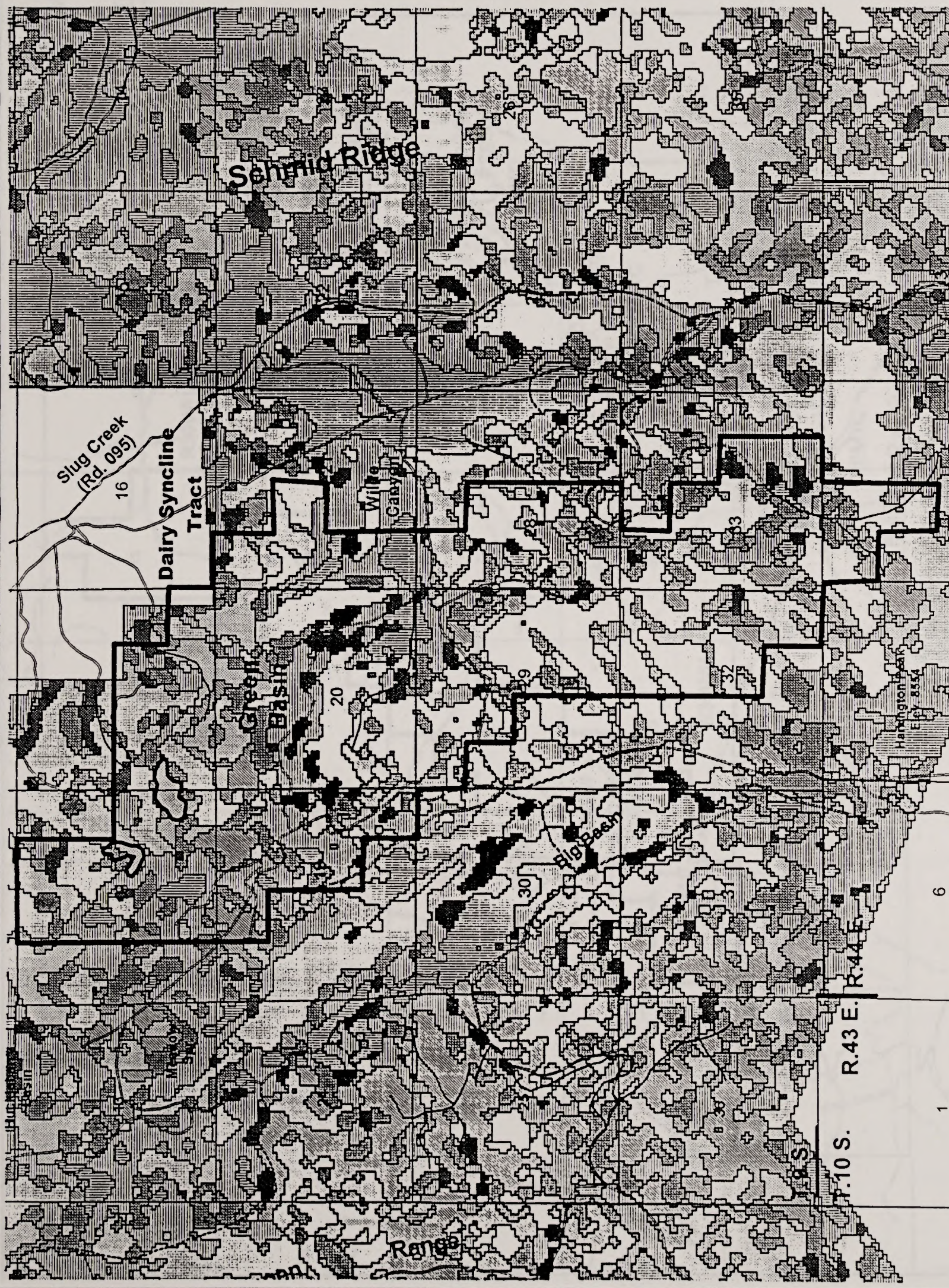
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100 ft. contour interval
100 ft. contour interval
100 ft. contour interval



Figure 3 - 13
Dairy Syncline Tract
Vegetation Types
(Old Growth & Timber)



Legend

- Proposed Lease Tract
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Vegetation Types
- Uncoded Data
- Lodgepole Pine
- Douglas-fir
- Mixed Conifer
- Aspen
- Aspen/Conifer
- Timber Encroachment
- Sagebrush/Grassland
- Mountain Brush
- Old Growth (approx Size & location)



Map Source: Caribou
 National Forest
 GIS Library, 2/97

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Scale

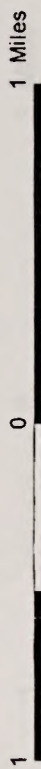
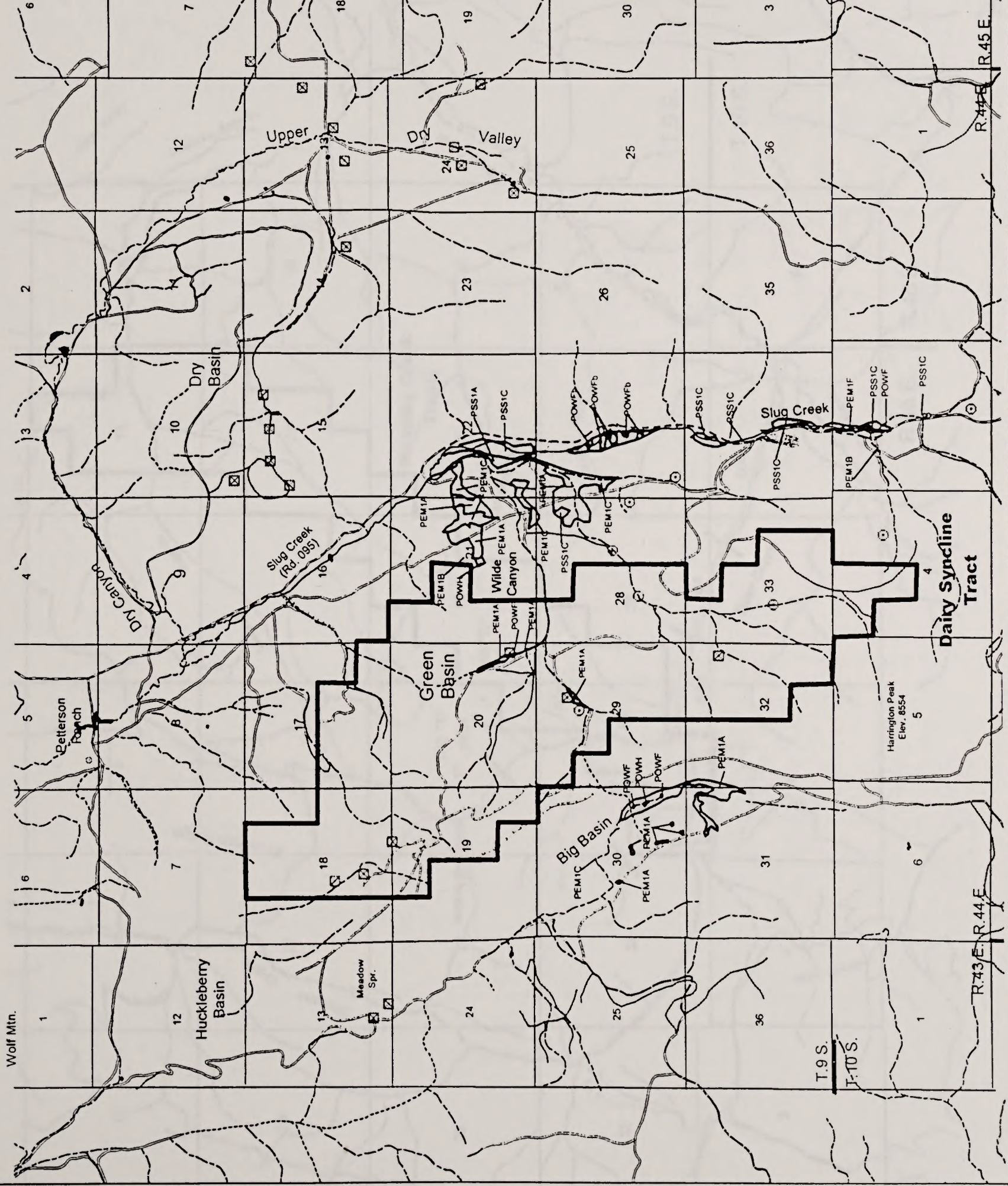


Figure 3-15
Dairy Synchrony Tract
Perennial &
Intermittent Streams



LEGEND

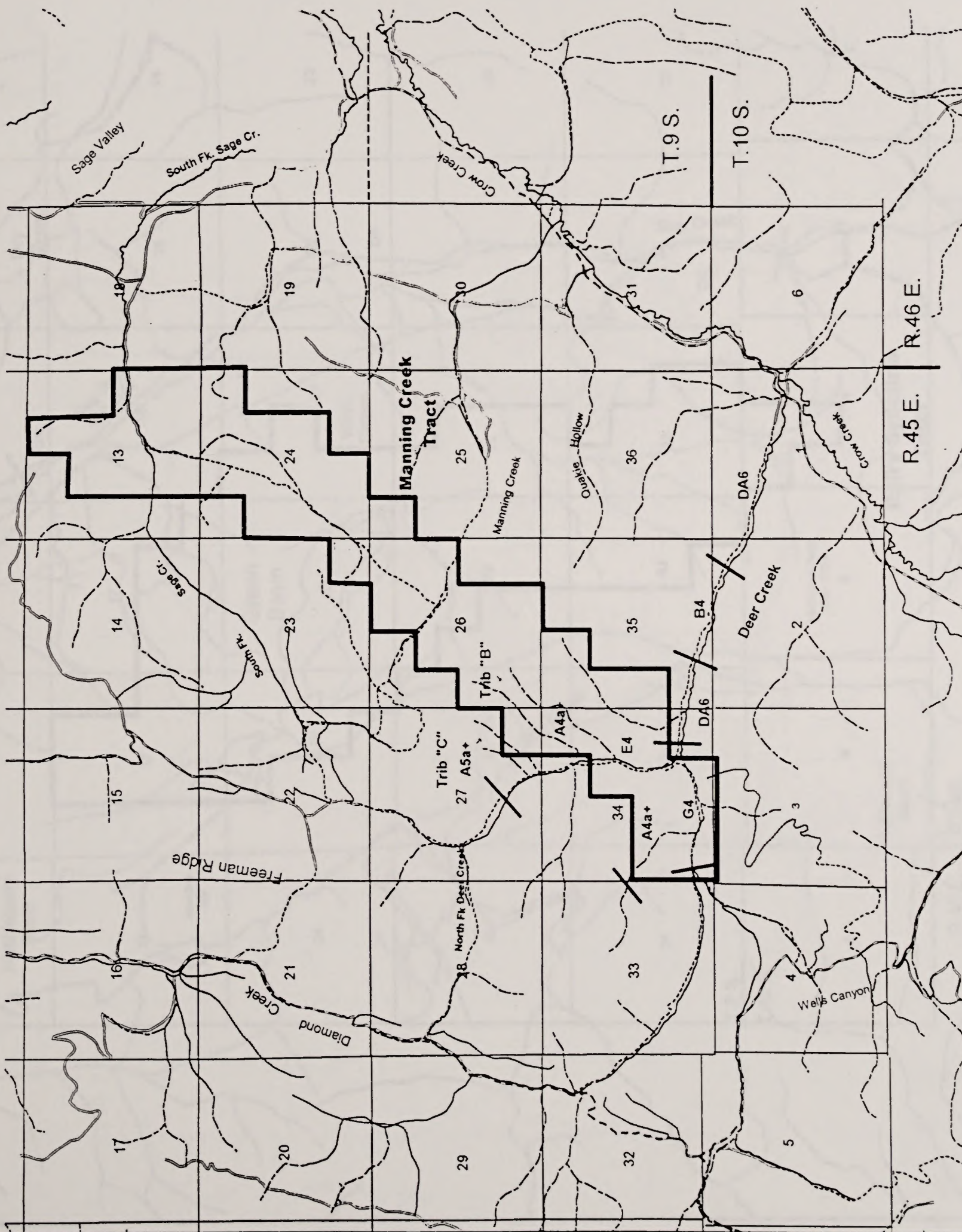
- Perennial Stream
- Intermittent Stream
- Ponds/Standing Water
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Water Development
- Spring
- Wetland
 - P = Palustrine
 - EM = Emergent
 - A = temporary, B = saturated
 - C = seasonal
 - F = semi-permanent
 - OW = Open Water
 - F = semi-permanent
 - b = beaver
 - H = permanent
 - SS = Shrub/scrub
 - 1 = broad-leaf deciduous
 - A = temporary, B = saturated
 - C = seasonal
 - F = semi-permanent

Map Source: Caribou National Forest GIS Library, 2/97

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Scale
 0 1 Miles

Figure 3 - 16
Manning Creek
Tract, ROSGEN
(1994) Stream Typing



LEGEND

- Proposed Lease Tract
- ~ Perennial Stream
- ~ Intermittent Stream
- ~ Gravel Road
- ~ Improved Dirt Road (3C)
- ~ Improved Road (Dirt Surface)
- ~ Unimproved Dirt Road
- ~ Uncoded Road
- ~ Trail
- Section Lines (Township & Range)
- Stream Segment
- DA Rosgen Classification
 - Aa+ = Very steep, deeply entrenched
 - A = Steep, entrenched
 - B = Moderately entrenched
 - C = Low gradient
 - D = Braided channel
 - DA = Multiple channels, narrow & deep
 - E = Low gradient
 - F = Entrenched meandering
 - G = Entrenched "gully"
- 1 = Bedrock 2 = Boulder
 3 = Cobble 4 = Gravel
 5 = Sand 6 = Silt/Clay

Δ

Map Source: Caribou
 National Forest
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Scale

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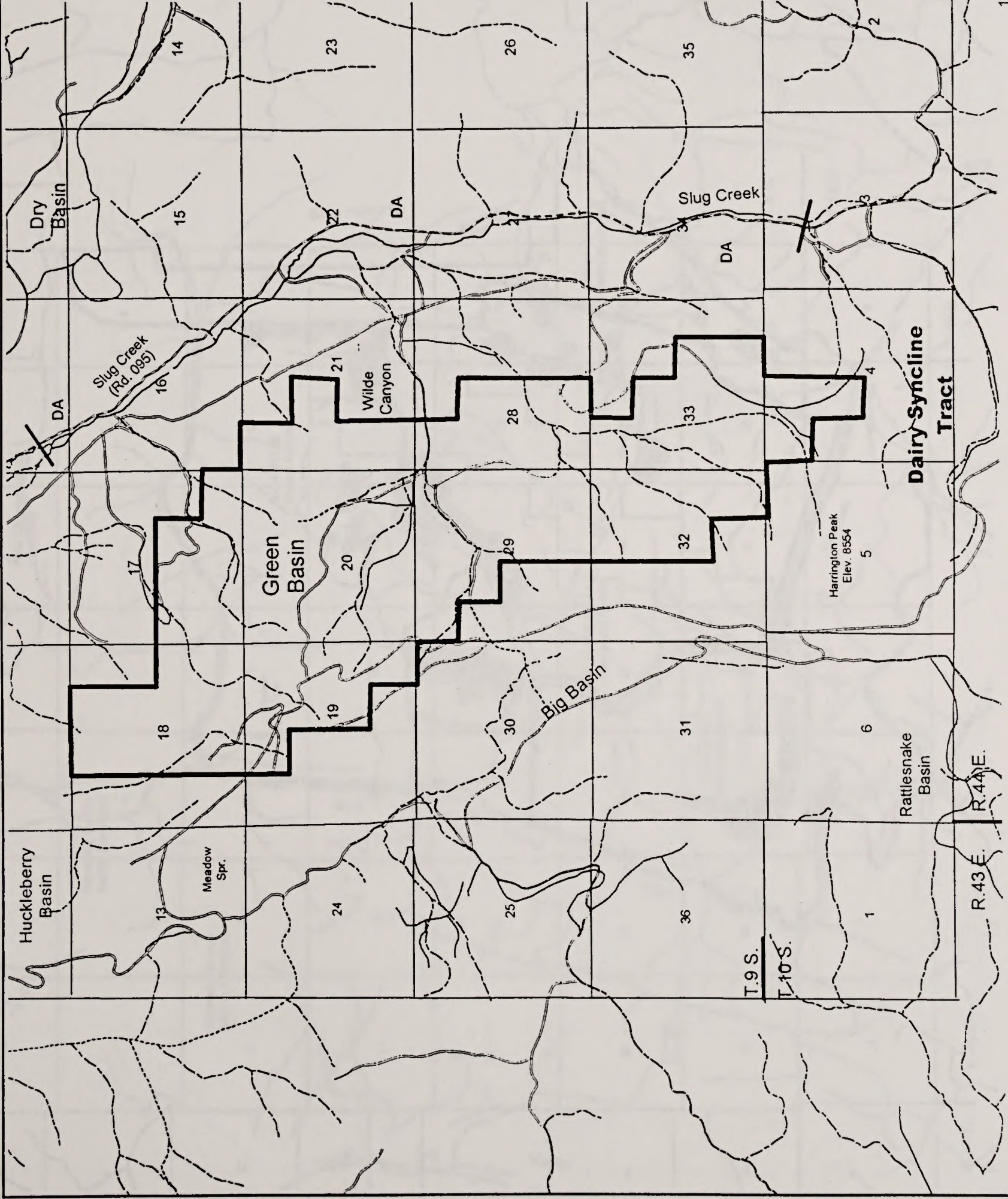
1 Miles

Figure 3 - 17
Dairy Syncline Tract
ROSGEN (1994)
Stream Typing

LEGEND

- Proposed Lease Tract
- Perennial Stream
- Intermittent Stream
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Stream Segment
- DA Rosgen Classification
DA = Multiple Channels

A



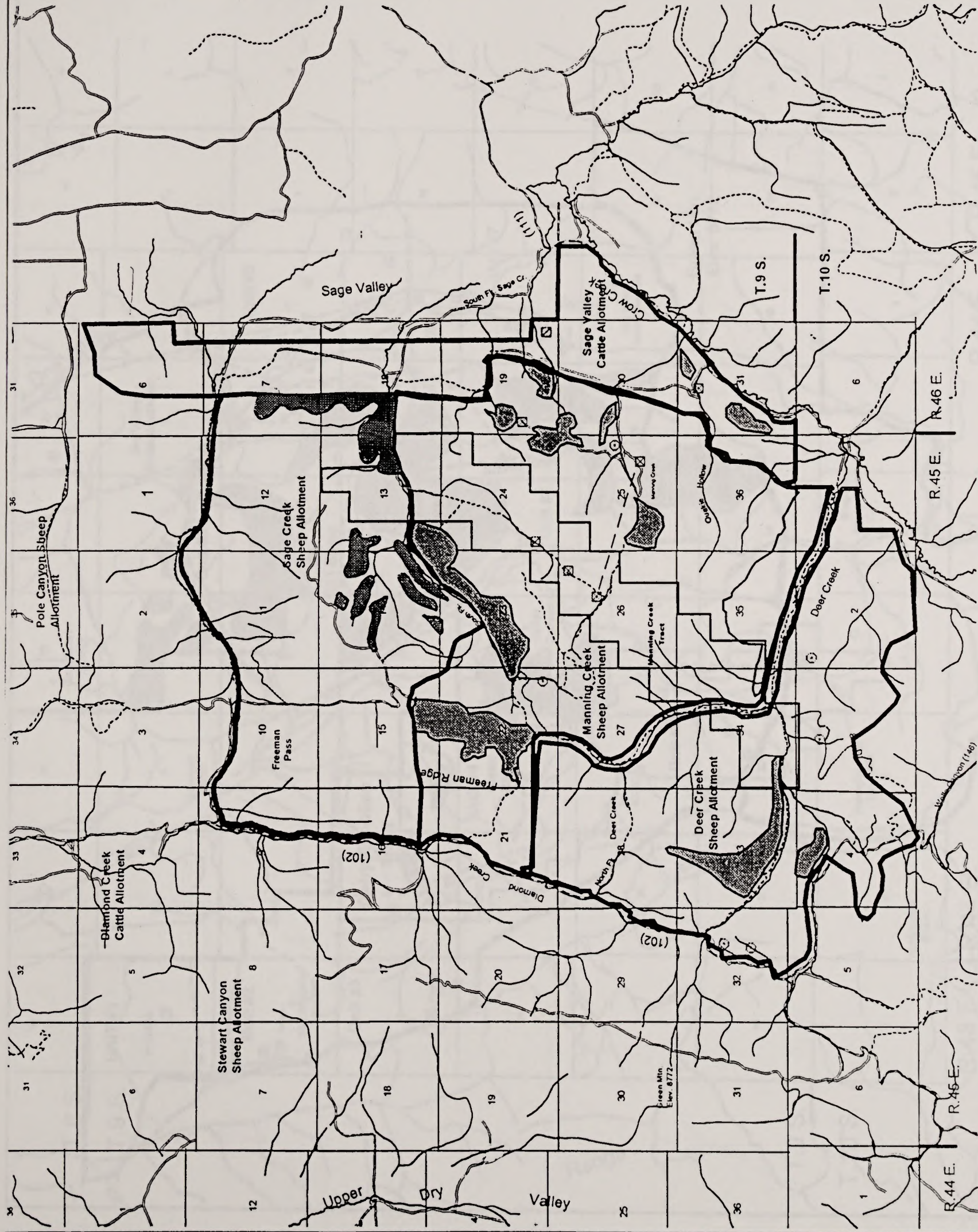
Map Source: Caribou
National Forest
GIS Library, 2/97

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Scale

0 1 Miles

Figure 3 - 18
Manning Creek Tract
Range Allotments &
Suitable Range



Map Source: Caribou
National Forest
GIS Library, 2/97

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Scale

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Figure 3 - 19
Dairy Syncline Tract
Range Allotments &
Suitable Range

LEGEND

- Proposed Lease Tract
- Range Allotment
- Unsuitable Range
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Drainages
- Water Development
- Spring
- Pipeline
- Grazing Units

A

Map Source: Caribou
 National Forest
 GIS Library, 2/97

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Scale

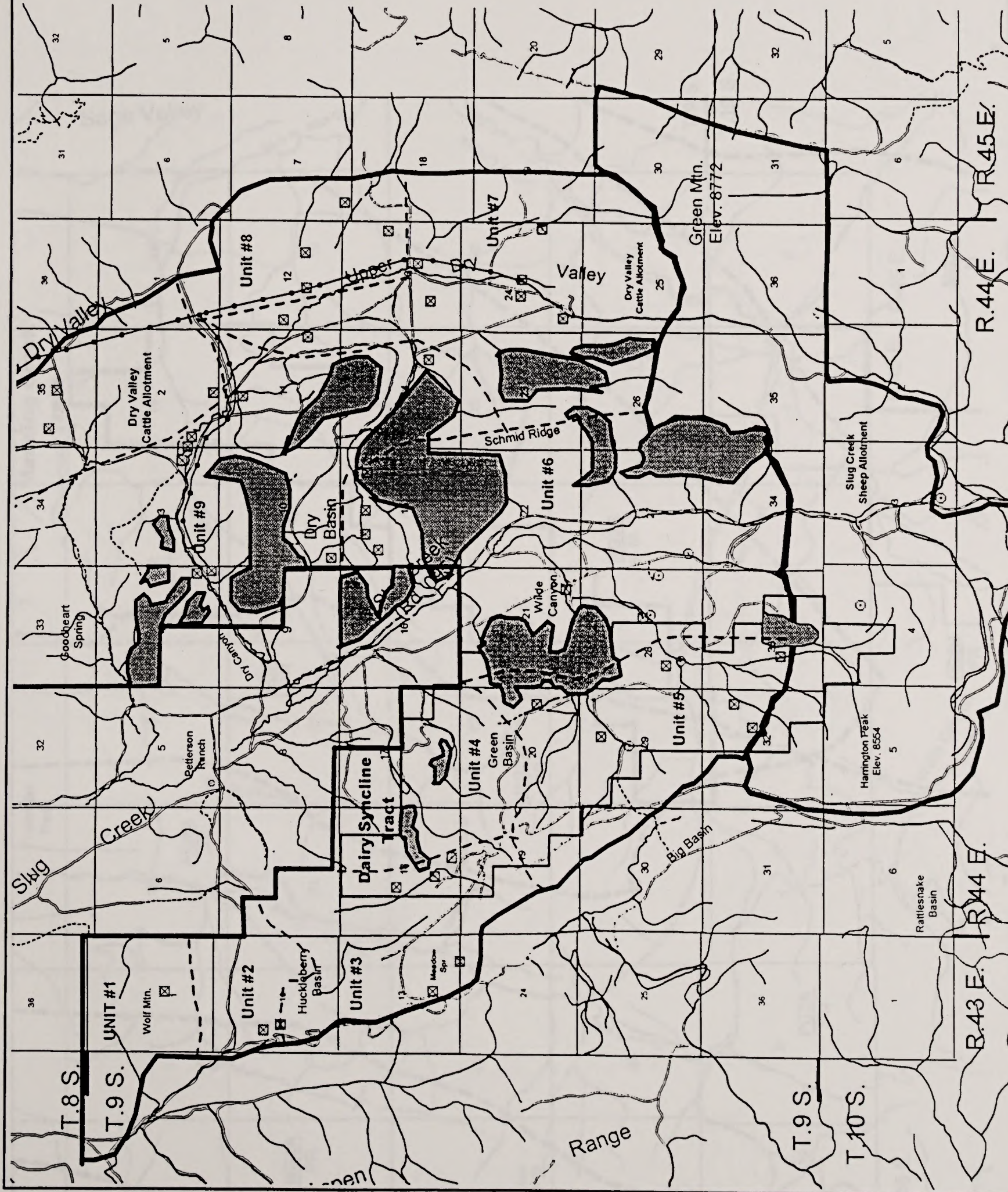
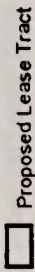


Figure 3 - 20
Manning Creek Tract
Visual Resources

LEGEND



Proposed Lease Tract
Visual Management
System Definitions

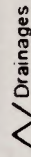
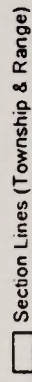
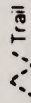
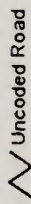
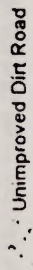
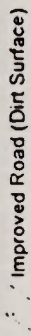
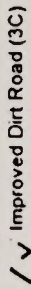
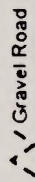
MG2B where MG = Distance
Zone; 2 = Sensitivity Level;
B = Variety Class; & PR =
Visual Quality Objective

Distance Zone
MG = Middleground
FG = Foreground

Sensitivity Level
1 = Level 1 (highest sensitivity)
2 = Level 2 (average sensitivity)

Variety Class
A = Distinctive
B = Common
C = Minimum

Visual Quality Objectives
PR = Partial Retention
M = Modification



Map Source: Caribou
National Forest
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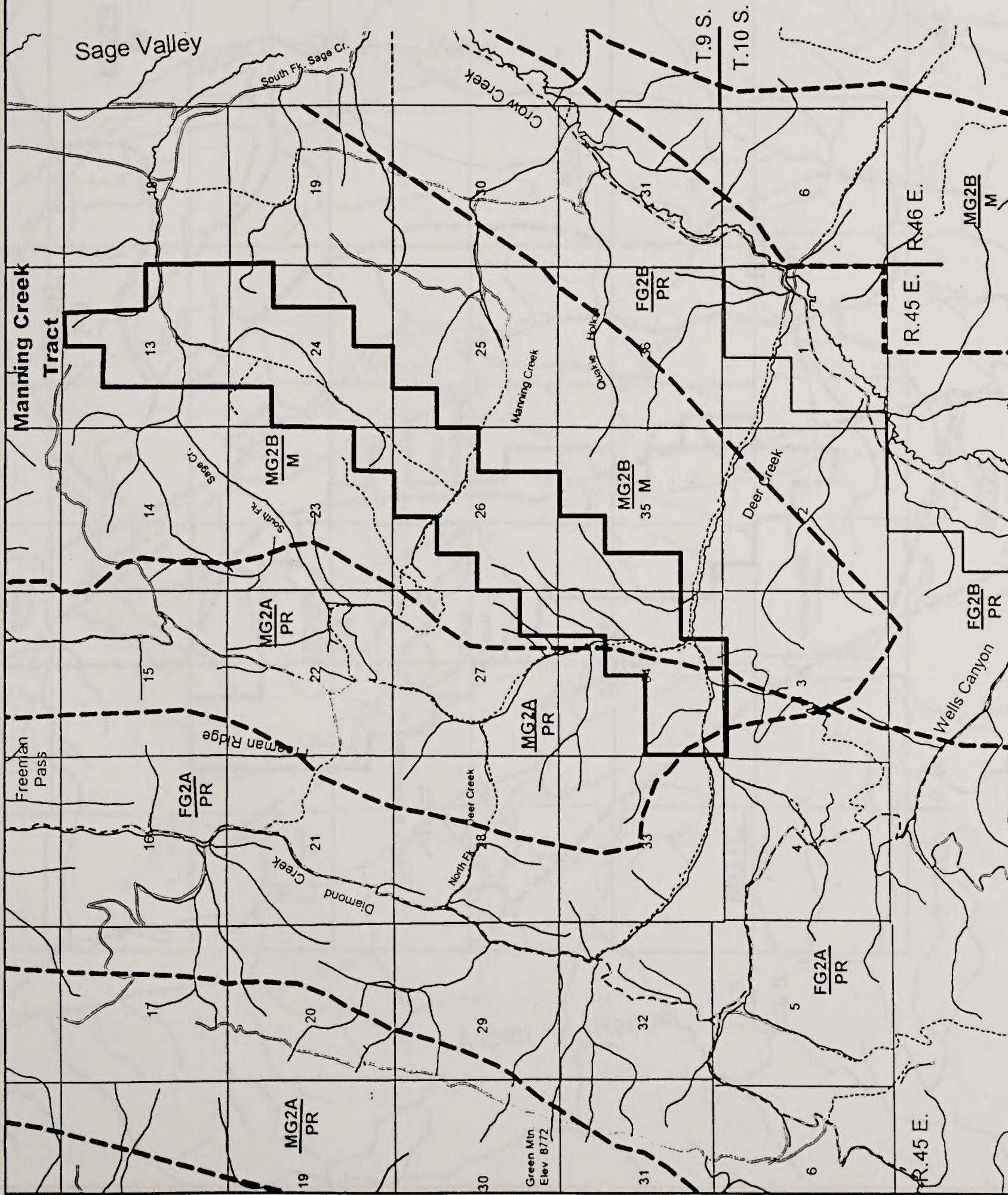


Figure 3 - 21
Dairy Syncline Tract
Visual Resources

LEGEND

Proposed Lease Tract
 Visual Management System Definitions
 MG2B where MG = Distance
 PR Zone; 2 = Sensitivity Level;
 B = Variety Class; & PR =
 Visual Quality Objective
 Distance Zone
 MG = Middleground
 FG = Foreground
 Sensitivity Level
 1 = Level 1 (highest sensitivity)
 2 = Level 2 (average sensitivity)
 Variety Class
 A = Distinctive
 B = Common
 C = Minimum
 Visual Quality Objectives
 PR = Partial Retention
 M = Modification
 Gravel Road
 Improved Dirt Road (3C)
 Improved Road (Dirt Surface)
 Unimproved Dirt Road
 Uncoded Road
 Trail
 Section Lines (Township & Range)
 Drainages

Map Source: Caribou
 National Forest
 GIS Library, 2/97
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N
 Scale
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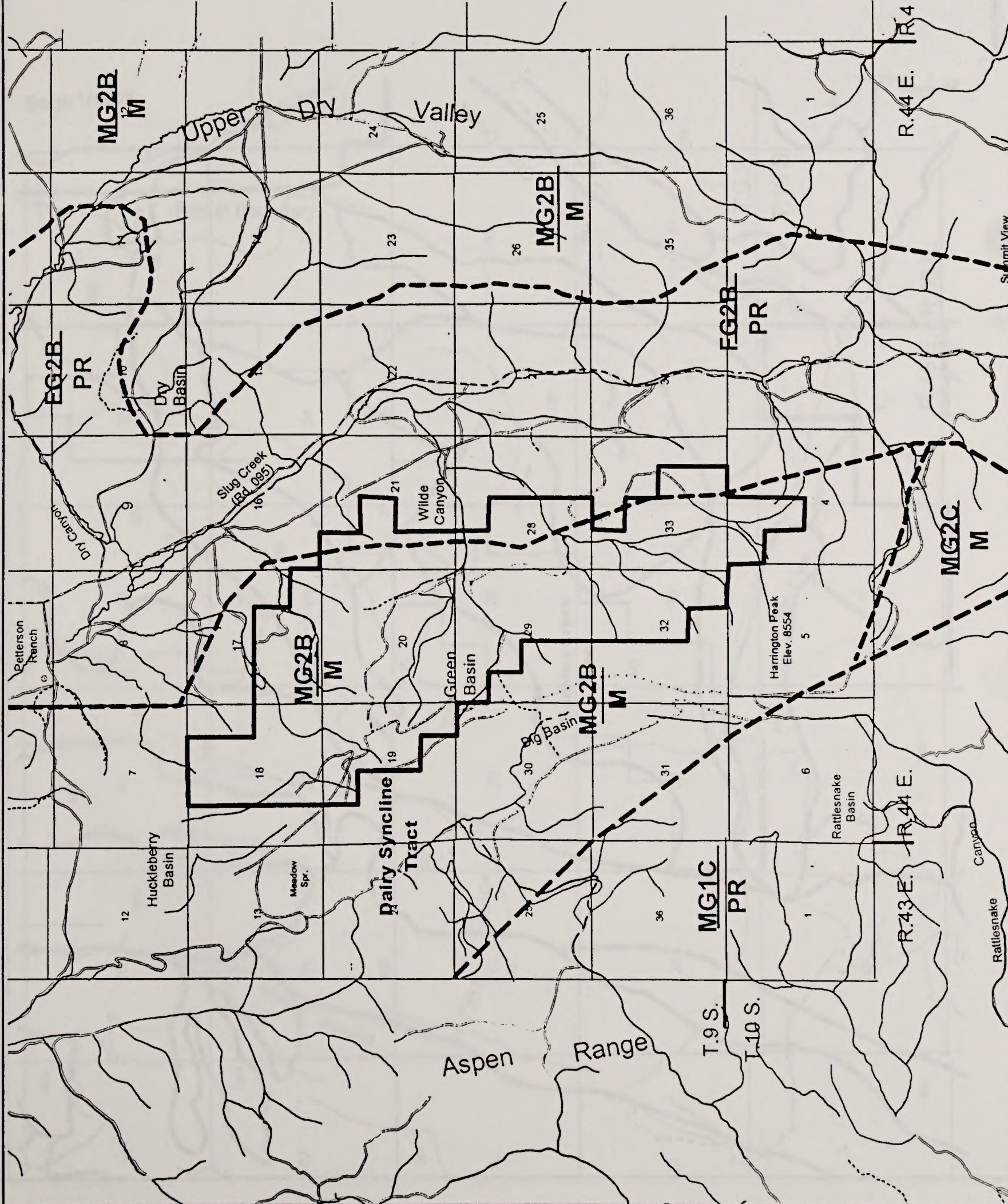
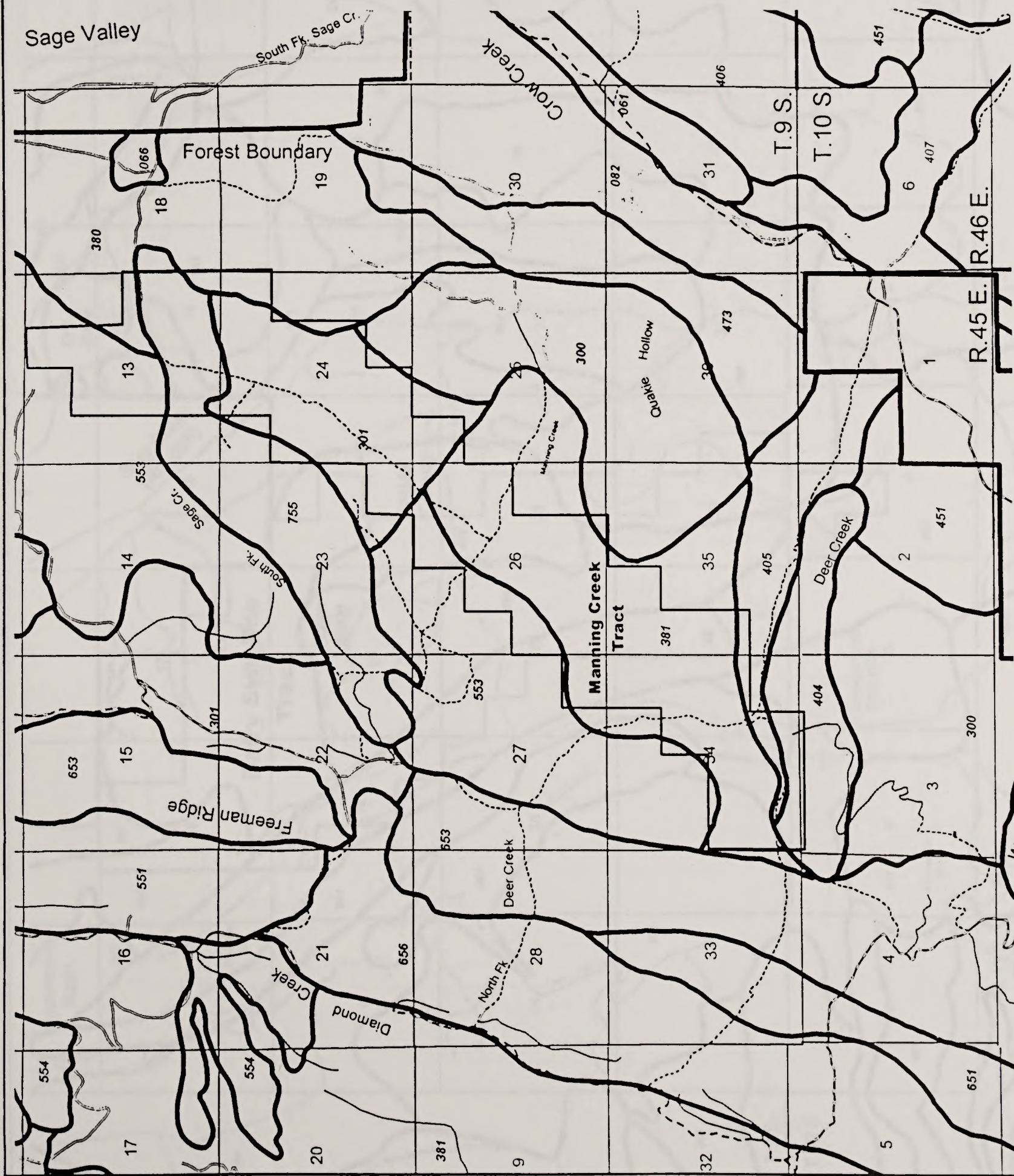


Figure 3 - 22
Manning Creek Tract
Soil Mapping Units



LEGEND

- Proposed Lease Tract
- Soil Mapping Units
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)

Δ

Map Source: Caribou
National Forest
GIS Library, 2/97










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Scale



Figure 3 - 23
Dairy Syncline Tract
Soil Mapping Units

LEGEND

-  Proposed Lease Tract
-  Soil Mapping Units
-  Gravel Road
-  Improved Dirt Road (3C)
-  Improved Road (Dirt Surface)
-  Unimproved Dirt Road
-  Uncoded Road
-  Trail
-  Section Lines (Township & Range)

Δ

Map Source: Caribou
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0 1 Miles

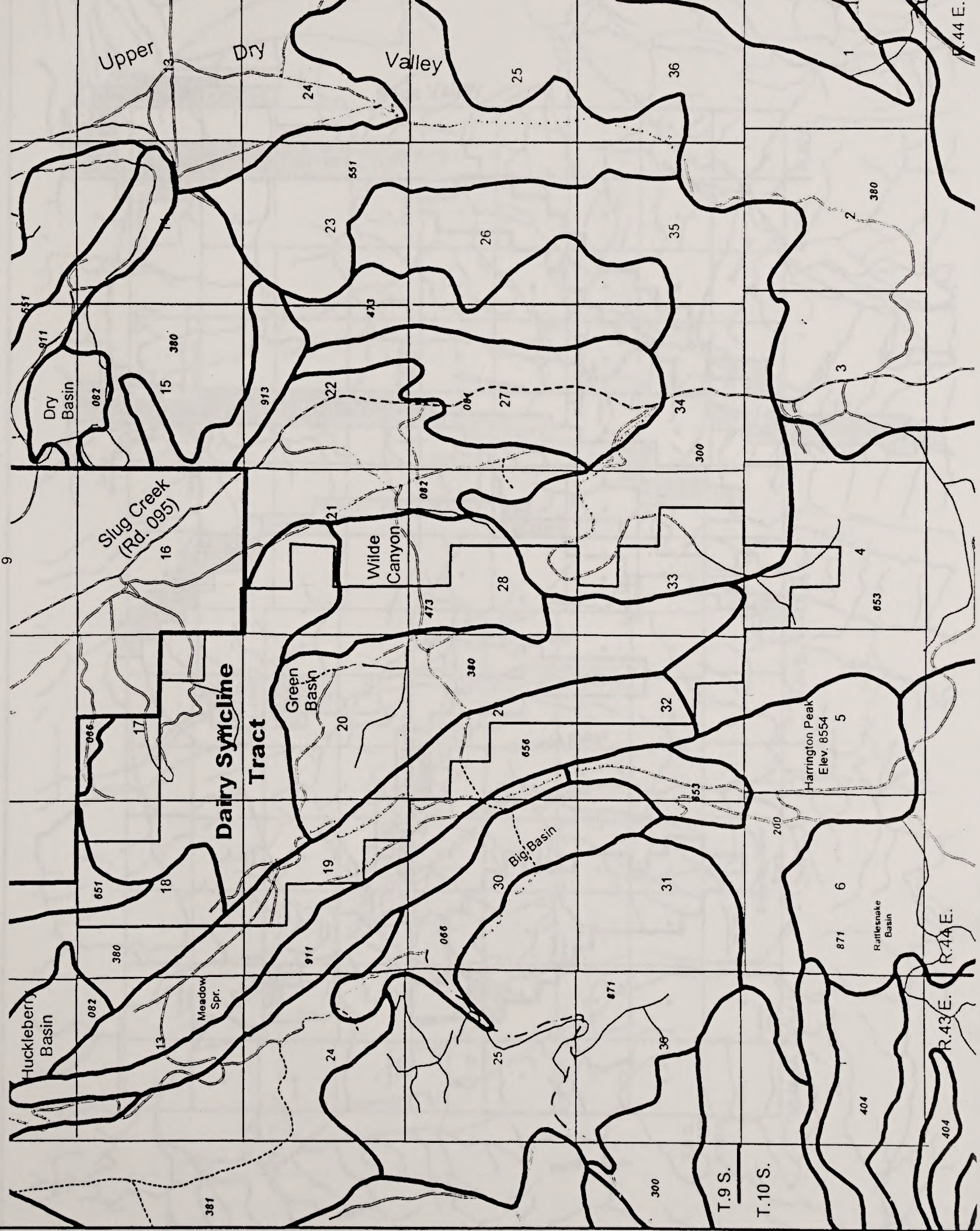


Figure 3 - 24
Some Existing
Federal
Phosphate Leases

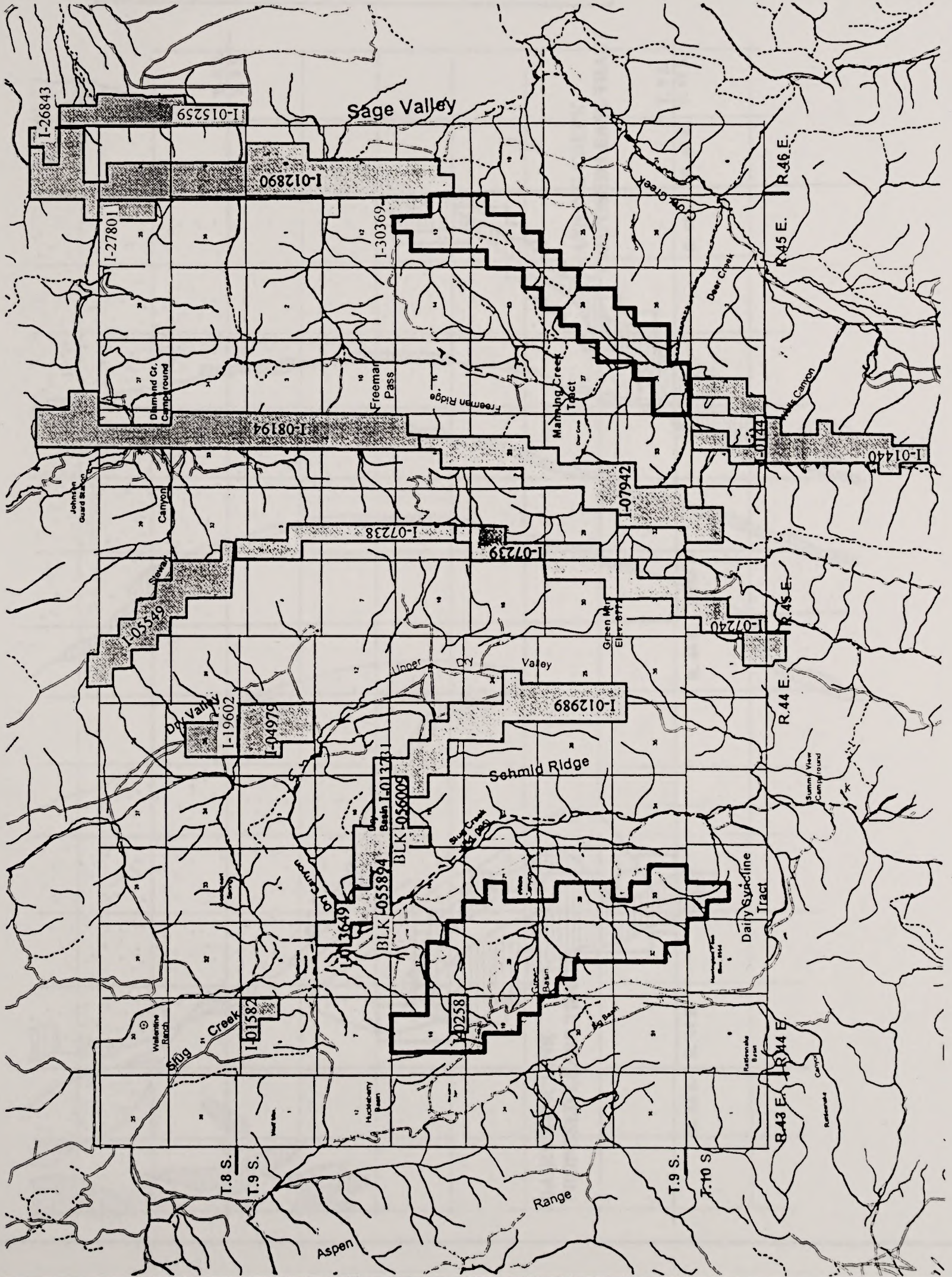
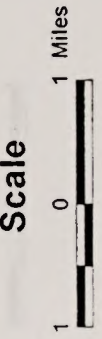
LEGEND

- Manning Creek & Dairy Syndline Tracts
- Existing Phosphate Leases
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Drainages

A

Map Source: Caribou
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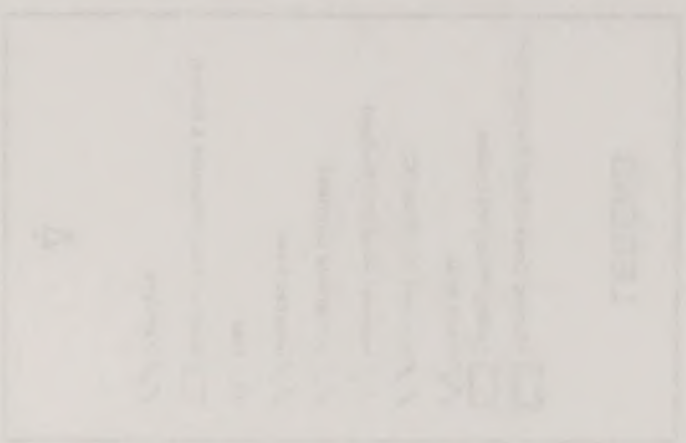


10-6-370014

General Notes

Legend

Scale 1:250,000



Scale 1:250,000

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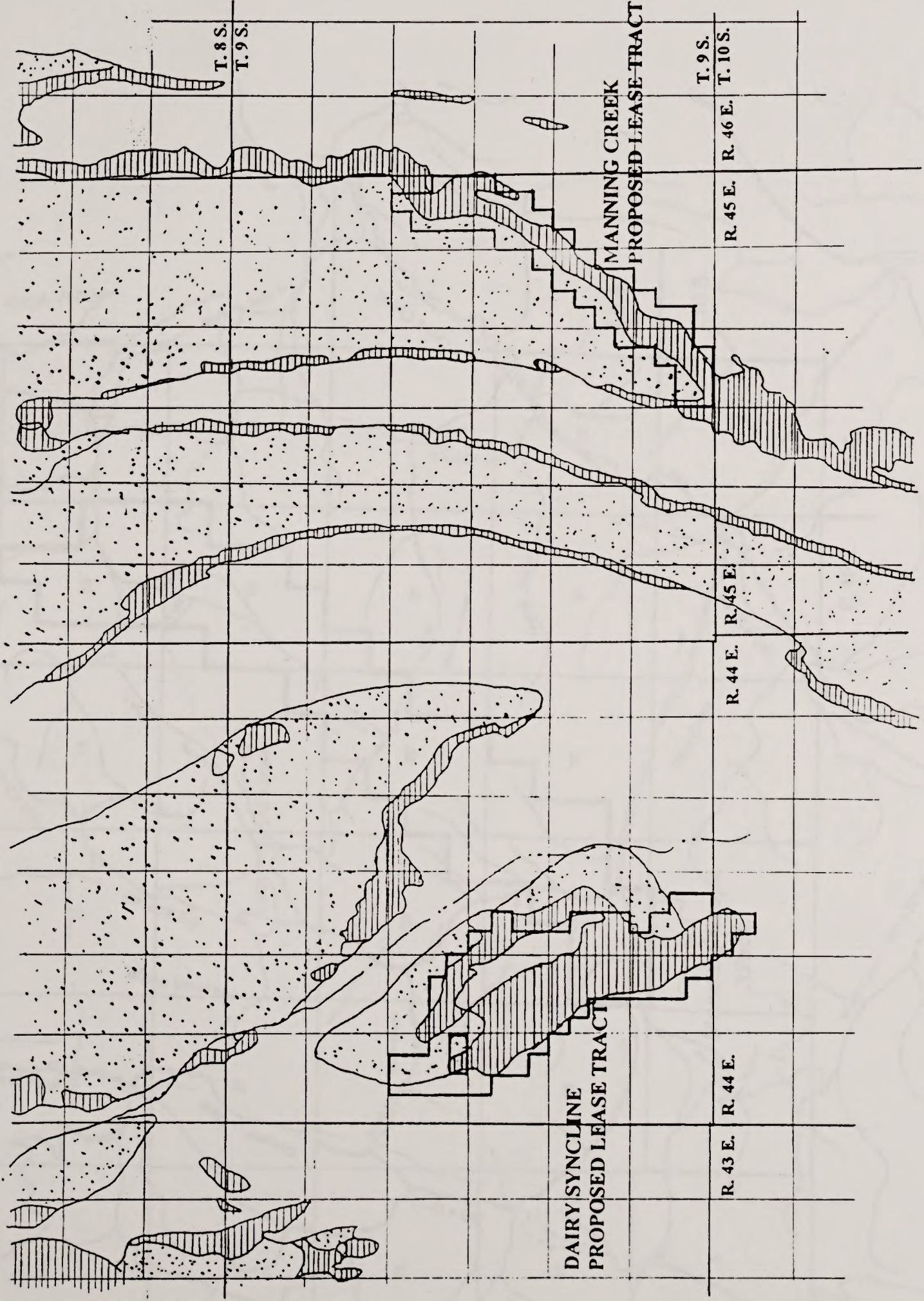
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Figure 3-25
Phosphoria Formation
& Outcrops

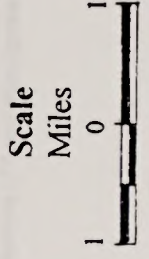


LEGEND

- Manning Creek & Dairy Syncline Tracts
- Phosphoria Formation
- Phosphate Outcrop

Map Source: Pocatello
 Resource Area, BLM

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Scale
1:50,000

Quaternary deposits
Alluvial deposits
Glacial deposits
Post-glacial deposits

Quaternary deposits
Alluvial deposits
Glacial deposits
Post-glacial deposits



Legend
Quaternary deposits
Alluvial deposits
Glacial deposits
Post-glacial deposits

Scale
1:50,000



Figure 3 - 26
Manning Creek Tract,
Existing Transportation
System (Roads & Trails)

LEGEND

- Proposed Lease Tract
- ▤ Gravel Road
- ▥ Improved Road (Dirt Surface)
- ▧ Unimproved Dirt Road
- ▨ Uncoded Road
- ▩ Trail
- Section Lines (Township & Range)
- ▬ Drainages

A

Map Source: Caribou
 National Forest
 GIS Library, 2/97

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Scale

1 0 1 Miles

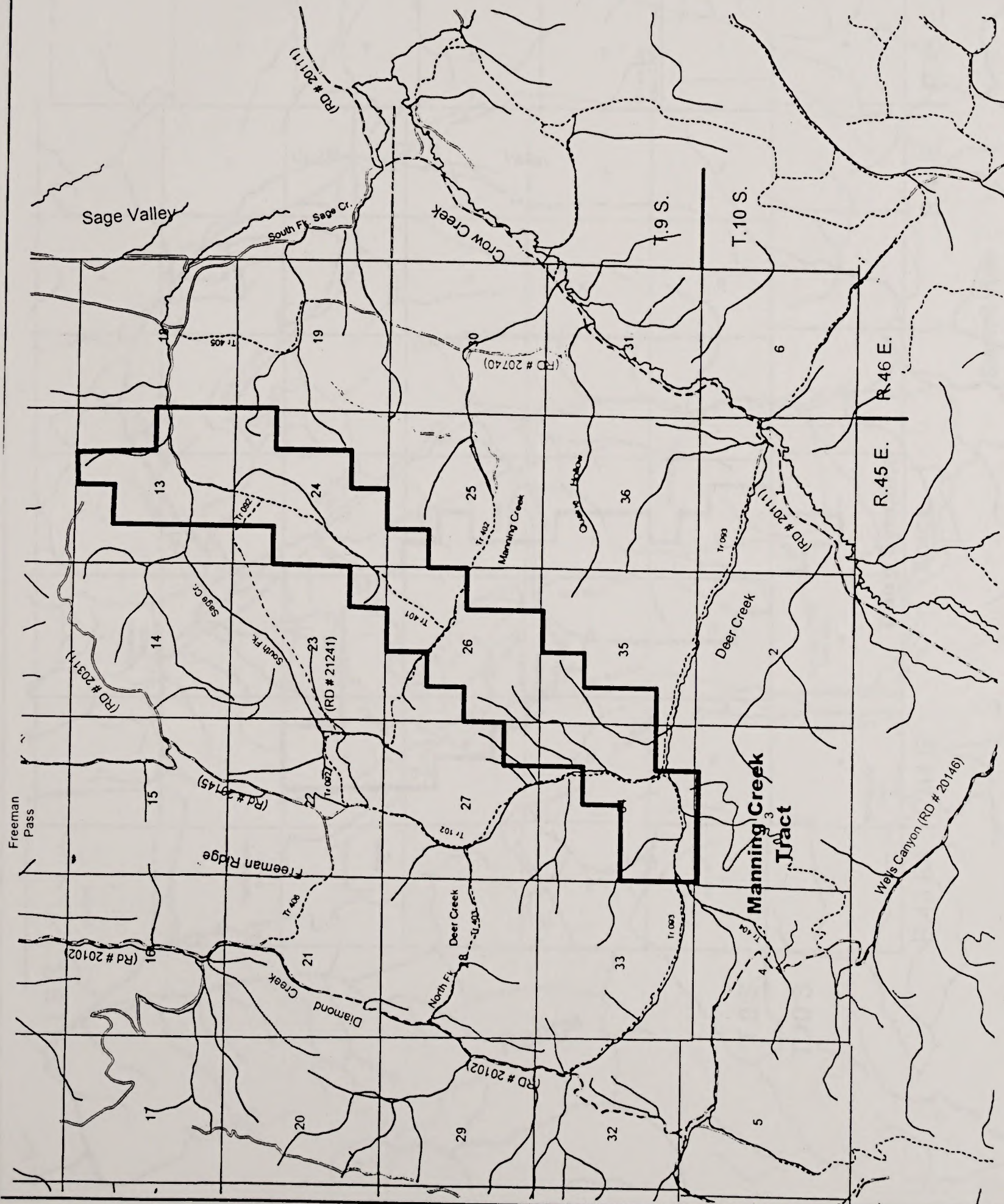


Figure 3 - 27
Dairy Syncline Tract
Existing Transportation
System (Roads & Trails)

LEGEND

- Proposed Lease Tract
- Gravel Road
- Improved Dirt Road (3C)
- Improved Road (Dirt Surface)
- Unimproved Dirt Road
- Uncoded Road
- Trail
- Section Lines (Township & Range)
- Drainages

4

Map Source: Caribou
National Forest
GIS Library, 2/97

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Scale

